The Standard Model within a Cosmological Setting?

By Jack Wenger

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Abstract: Try another way of looking at the universe. Consider spatial dimensions as measurements of interfaces. These interfaces can have two or more sides. We can see this if we think of thick oil spreading on water. We have three 3D substances, water, oil, and air. There is a water/oil 2D interface, an oil/air 2D interface and ahead of the oil intrusion a water/air 2D interface. Furthermore there is a linear or 1D interface at the front where the oil is advancing and all 3D substances touch. This interface has three sides. This relationship could also be described this way: Where two 3D substances meet they form a (3-1)D interface and where three or more 3D substances meet they form a (3-2)D interface. This allows the speculation that all higher dimensional systems may form interfaces in this fashion when substances within those systems interact in a manner similar to that described above.

The pattern suggested is:

When N (as in ND) is a whole number greater than 1, two adjacent ND substances can form an (N-1)D interface between them and three or more ND substances can meet at a (N-2)D interface. This interface has three or more sides.

This in turn allows the suggestion that there could be an infinite 5D sphere made up of infinitely small 5D units that have settled into concentric fluidic layers according to some analogs to gravity and density, and that a higher (or lower) layer, having undergone a change in density, is in the process of

reestablishing itself in the layer hierarchy. This could entail its intrusion between two layers having only slightly different densities.

If this were the case and the 5D substances followed the pattern described above, it would have two 4D (5-1) interfaces where it contacted the fluids on either side and a 3D (5-2) interface where all three fluids met, at the front of intrusion.

Infinitely small 5D substance units (5D molecules, 5D atoms) would allow the layers to be extremely thin, thinner than any observable 3D object at the 3D interface but still the size of these units could have ratios to the layer's thickness similar to the ratio of a water molecule's size to the depth of the deepest ocean. Much would be allowed under these conditions.

When considering a great circle along the 3D interface, the speed of its expansion would be 2pi times the rate of intrusion. That is the change in the radius will always equal 1/2pi the change in circumference size.

If the circumferential expansion of the 3D interface was equal to the expansion rate of our cosmic horizon, the intrusion rate would be 1.007 times our light speed. If its circumference was greater, maybe many times the size of our cosmic horizon, the rate of intrusion would be many times light speed. We suggests that the speed of intrusion within the Shear Dependant Universe (SDU) would probably be many times light speed. These speeds would not need to be constant. They would be affected by the rate of fluid entry at the source.

The high speed of intrusion and perhaps other characteristic of the fluids could create shear. This shear could be expressed as vortices at all interfaces, if all fluids were similar in "density". If the 5D sphere were rotating, vortices at the upper 4D interface would rotate opposite those at the lower, when moving in the same direction along the 3D interface, therefore the 3D interface would contact vortices of both rotations. The picture here is of dense chaotic vortex fields on all sides of all interfaces. In addition, vortices can merge or concentrate to form structures at the 3D interface as described below.

Vortices create wakes by applying torque to the 3D interface as they move over it. Those at the upper 4D interface create torque wakes that are opposite those at the lower. Vortices tend to draw closer together or concentrate with others having similar torque wakes and move way from those with incompatible wakes when traveling in the same 3D direction. However vortices having opposite rotation can concentrate if they are traveling in opposite 3D directions. Vortices with incompatible wakes move away from each other.

Combined torque wakes of sufficient intensity can capture "swarms of vortices" on any or all sides of the 3D interface. These swarms can result in fields with various shapes. The shape of some of these fields is cyclonic with tubular centers or eyes, their bases attached to the 3D interface via compatible torque. Others have an anti cyclonic form with oppositely rotating eyes that are also attached to the 3D interface through appropriate torque contours. A single torque pattern at the 3D interface can accommodate several cyclonic or anti cyclonic swarms on any of its sides, these swarms will simply rotate in appropriate directions. Opposite rotation is allowed because these swarms are on opposing sides of the 3D interface and cannot conflict with each other.

These are diffuse columnar swarms with highly concentrated centers where there is maximum torque or deformation of the 3D interface. If a swarm conglomerate is set in motion, torque is increased on the side of motion direction by an increased encountering and accumulation of background shear. This increased vortex concentration and torque, ahead of the eye causes the whole swarm to shift in this direction which in turn reestablishes the higher vortex concentration and maintains the off center torque, constantly reinforcing the direction of travel. This feedback loop with background shear becomes the basis for inertial mass.

Those solo swarms that occupy only the outside of one the 4D interfaces (one quark) are swept away by the backflow immediately. Swarm pairs that occupy both sides of a single 4D interface (two quarks) and have some attachment with the 3D interface remain in contact a little longer but are also swept away. Swarm trios or quartets, that occupy all sides of the 3D interface (three quarks) and are anchored by a common torque pattern at the 3D interface, remain attached. They are still occupying only three fluid sectors so they could appear as only three objects (three quarks) from the 3D point of view. These would be matter and anti matter.

Torque energy is never gained or lost. It is always recaptured by background shear forming photonic structures, other transient swarms or it transforms complex swarms or alters their motion.

Vortices also cause indentations to form on the 3D interface via drag. Large swarms of vortices have considerable drag and tend to allow collections within the indentations. The indentations do not need to be very deep to be highly "attractive" because the 3D interface at the indentations is no longer perpendicular to the direction of intrusion, so they acquire a tiny fraction of the intense back flow from the interface advancement, forming "virtual wells" which when present in accumulations are the foundation of SDU gravity. These shear vortices contribute both to mass and "virtual wells" (gravity) and become the grounds for an SDU Equivalence principle

Photonic structures follow the same rules stated above but form perpendicular sheets in response to waves of passing torque (which are a winding and then unwinding of the 3D interface). Shear vortices become oriented in one direction as the interface winds up. They also tend to coalesce to a point in response to their tendency to merge. As the wave meets its maximum and begins to unwind, vortices in the first orientation escape up the connecting 4D interface and shear immediately provides a second generation of vortices in the new orientation which again coalesce and so the action is continuously repeated until all cycles of torque have passed. Thus the wave is maintained and confined to the 3D interface by background shear. This involvement with the background shear also limits the speed of passing torque waves.

The action of coalescing is never completed in any of these structures. In light, background shear continues to move in the direction of the highest torque during the whole cycle, so there is a field of vortex motion extending for quite a distance on either side of the coalescing point. In matter there are also merging fields of vortex motion all around the cylindrical swarms. All of these structures can interfere with themselves under the right conditions.

In this setting, vortex swarms become the currency between matter and energy.
If each fluid is viewed as a 5D compartment around the 3D interface, the system is compatible with either 16D or 18D spacetime scenarios depending on whether time is the extra dimension of the whole or of each compartment. 5D+5D+5D+1D of time=16D   5D+1D of time+5D+1D of time+5D+1D of time=18D
However the collision debris characteristics of each compartment could seem to come from different 5D (or 6D spacetime) systems if compartmentalization is not considered.
Thus the properties of the least dense fluid in the upper compartment are consistent with those of a "heavier quark" in that the collision debris would contain many more "particles" and therefore have greater mass than the other two quarks. These particles would also have shorter life spans then those of the intruder compartment because of the upper fluid's backwash
. The lower compartment debris would also have shorter life spans because of the lower fluid's backwash but fewer particles because of its greater density and be viewed as a "lighter quark".
The intruder compartment would have properties of "strange quarks" in that its collision debris would be comprised of varying percentages of "positive and negative" charged particles depending on the nature of the colliding matter.

SDU baryons would have swarms within all three partitions (three quarks). SDU mesons would have two swarms, one each on two sides of the 3D interface (one quark and one antiquark). SDU lepton swarms would occupy only one partition and would not be perceived as quarks.

It is relatively easy to describe many physical phenomena in these terms such as the four known forces (gravitational, strong, weak, and electromagnetic) and the many quantum phenomena. Light speed is dependant upon the rate of shear creation. The universal expansion rate varies with fluid input at the source. Dark matter simply becomes a variant swarm configuration. Faster than light, waveforms are allowed within the fluids between the interfaces.

The above description becomes the scenario for a universe very similar to ours.

"The Standard Model within a Cosmological Setting"

The Fish Tank

Within this universal model we will treat all spatial systems as complex interfaces. I may occasionally revert to traditional nomenclature but for the most part I will be thinking of them (and I hope the reader can also) as interfaces.

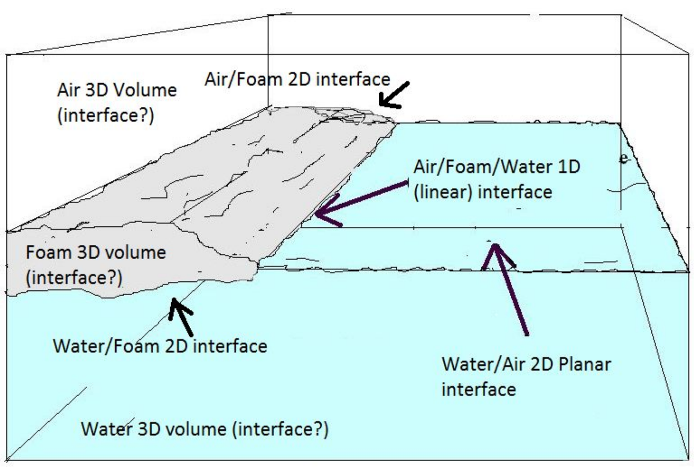


Fig 1

Imagine a large fish tank half full of water with no fish (Fig 1). There is a 2D interface between the water and air. Introduce heavy foam at one end of the fish tank. I want it to be heavy enough to settle a little bit below the water and air interface but also to have some of its volume extend above this interface. Allow the foam to start moving toward the other end of the fish tank. The forward edge of the foam that intrudes between the air and the water contains a 1D interface where water, air and foam meet.

Notice:

One 3D substance can intrude between two other 3D substances and where it intrudes there is a 1D interface this is where all three 3D substances meet. We call these substances 3D because they have three axes each of which is perpendicular to the other two. I will be suggesting below that within this universal model, all spatial dimensions are measurements of interfaces, so this observation might possibly read: One 3D interface could intrude between two other 3D interfaces and where it intrudes there is a (N-2)D interface where all three 3D interfaces meet.

Another important point to be made here is that 3D objects can rotate about (N-2)D or linear axis.

Now back to the fish tank.

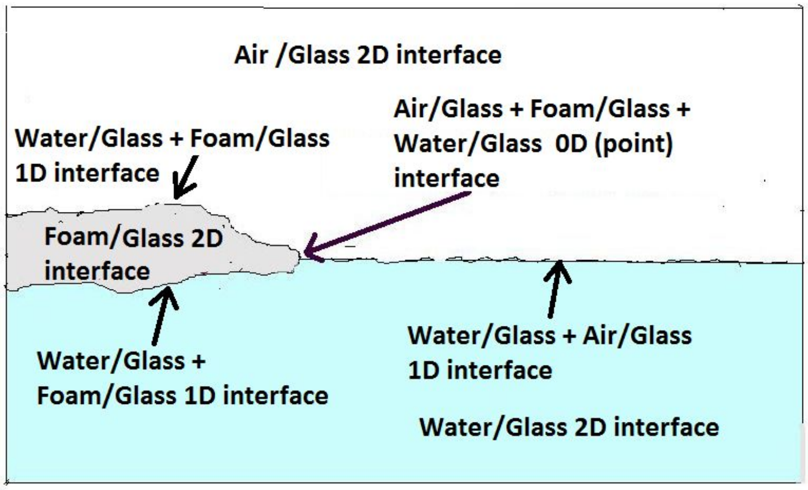


Fig 2

The glass of the fish (Fig 2) tank forms 2D interfaces with the water, foam and air. There are three. One is between water and glass. One is between air and glass. And one is between foam and glass. They are contiguous but still different interfaces. The foam/glass 2D (planar) interface is intruding between the air/glass and water/glass 2D (interfaces). The forward edge of the foam/glass 2D interface that intrudes between the air and the water 2D interfaces contains a 0D or (N-2)D (point) interface where water, air and foam all meet

This suggests another observation.

One 2D (planar) interface can intrude between two other 2D interfaces and where it intrudes there is a (2-2=0)D (point) interface where all three 2D (planar) interfaces meet.

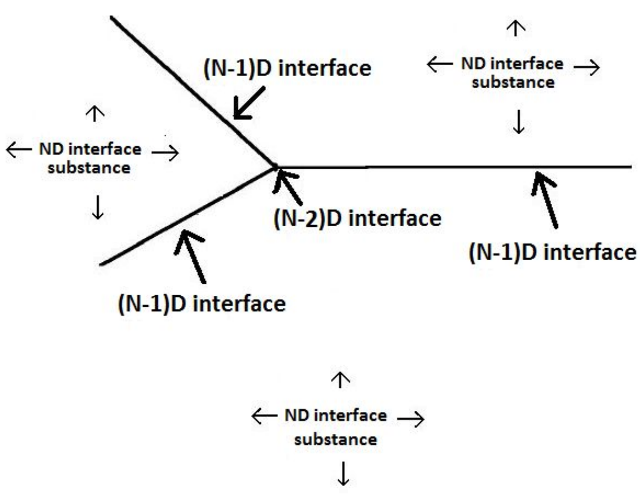


Fig 3

.It can also be observed that 2D objects (such as the surface of a disk can rotate about a (2-2)D axis.

I have only 2D and 3D examples but I'm going out on a limb and suggest that these may be some general properties of ND interfaces as illustrated in fig 3.

One ND interfacial substance can intrude between two other ND interfacial substances and where it intrudes there is a (N minus 2, N - 2)D interface. This is where all three ND substances meet.

The reader might also note that there are (N-1)D interfaces between adjacent ND interfacial substances on all three sides. Notice also, *the (N-2)D interface has three sides each contacting a ND substance.* These will come into play in the model below. These properties are not the only ones that might be attributed to interfacial configurations but they are the ones I will be using to describe this universal model because while it is true that I cannot think in 5D terms, *I can consider those properties that may be common to all spatial systems and get a partial picture of what may be happening..*

To summarize, the diagram above suggests that:

If N is a whole number greater than 1, three ND substances can meet at an (N-2)D interface and can rotate about an (N-2)D axis

Three 2D interfaces may meet at a (2-2)0D interface and can rotate about an (N-2)0D axis.

Three 3D substances may meet at a (3-2)1D interface and can rotate about an (N-2)1D axis

Three 4D substances may meet at a (4-2)2D interface and can rotate about an (N-2)2D axis;

Three 5D substances may meet at a (5-2)3D interface and can rotate about an (5-2)3D axis.

There is more on this topic in Appendix A below

The Big Swoosh Theory

When a star explodes in our universe, its shock wave has the potential to concentrate rarified matter into dense clouds. This allows gravitational attraction to condense the clouds further. As these clouds continue to condense they acquire angular momentum from incoming matter and begin to rotate. The stars and planets that are ultimately created by this activity are also given angular momentum from the parent cloud. They not only orbit its center of gravity but also have their own rotations.

Another characteristic of these objects is that they form layers. The most dense elements and substances settle to their centers. Other layers are shells, each shell has a density lower than the shell below it but greater than the shell above it.

Even a single component such as an atmosphere can have its own layers separated by energy content (heat) or saturation with water (as is found here on the earth). Any conditions out of balance will cause a shifting of layers. A heated layer can become less dense than the layer above. It then pushes through the upper layer spreading out over it and becomes let's say a hurricane. As it outgases, the Coriolis Effect changes its shape into a clockwise spiral above the equator. The air travels over a rotating reference, (the earth). A counterclockwise motion is given to the air at the surface as it approaches the center and a clockwise rotation to the air out gassing at the top.

For the sake of the Shear Dependant Universe (SDU), allow that 5D substances could undergo similar transformations. Allow their texture to be immeasurably finer than the texture of 3D matter (See below "Layers on the parent 5D hypersphere**")**. The 5D analog to gravity would weaken at the rate of $1/ r^4$ where r is the distance from the propagating source. Time scales here would be immeasurably long. Therefore the creation and demise of a 3D universe as described below could be as ephemeral when compared to the age of the 5D universe as the creation and demise of the great red spot on Jupiter when compared to the age of our universe.

Adequate time and perhaps other events could gather sufficient quantities of 5D substances to form analogous "proto" systems or clouds which could have rotation, created by analogous "angular momentum" of incoming material. Allow these clouds to continue to condense until they create orbiting hyperspheres. The hyperspheres should also rotate, having received angular momentum from incoming material. The substances of these hyperspheres should form layers, with the most dense "hyperatoms" or "hypermolecules" settling towards the centers.

Allow that this process is ancient, has been in progress for an immeasurable period of time and the 5D hypersphere formed is immeasurably large. So large that the finely textured materials that are layered at some distance from its center form thin sheets because they are so spread out relative to their total (hyper)volumes (somewhat like a drop of oil upon a large volume of water).

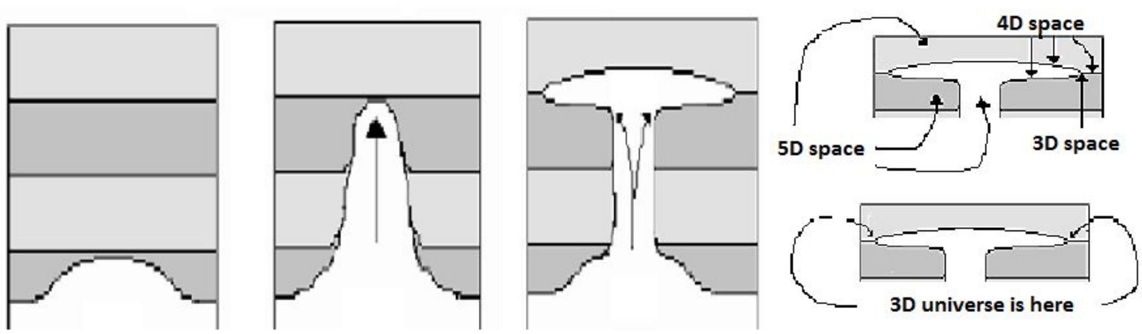


fig 4

The layer in motion that we are concerned with as described below would be slightly thicker because it is still in the process of spreading.

These fine layers will be used to account for certain effects but they are not shown as fine in the diagrams so that I can emphasize other concepts

Allow the interiors of the hyperspheres to generate analogous "heat" perhaps as energy released from hypergravitational pressures. Allow that layers of substances could be changed by this "heat" such that there is a change in density or perhaps the release of another substance.*

Let the substances be fluid (fig 4). Allow "heat" from the hypersphere interior to react with a substance further down releasing another fluid perhaps in a manner similar to the release of carbon dioxide at the Cameroonian lakes in Africa or methane from methane hydrate on the floor of an ocean. Allow this altered fluid to have an intermediate density between that of some upper fluids. The new fluid rises, passing through denser fluids until it reaches an upper layer which is less dense. It falls back onto the adjacent lower layer and spreads out between them.

On the periphery, where the three fluids and their 4D interfaces meet, there would be a new 3D interface, *a confined volume that had not existed before*.

Initially the penetration of the hypervolume of fluid would likely be such that its 3D interface's expansion greatly exceeds the speed that would allow any organized or uniform turbulence to exist. This could have effects similar to our "universal inflation". It should slow down as it spreads to allow uniform turbulence but could still exceed the speed of any transverse waves that could travel along the 3D interface.

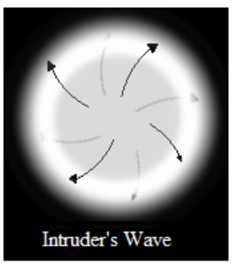
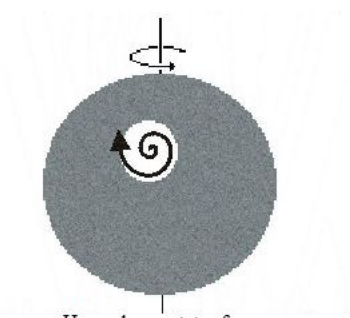


Fig 5

Allow that none of the fluids are permanently mixable with either of the other two, just as water, oil, and air are not permanently mixable in our universe. (I'm ignoring the possibilities of emulsions here.) Allow that their densities (or an analog to density) are very similar but different enough only to allow layering. Also allow that any bubbles that are created during the initial mixing of the fluids, to separate over time and recombine with their parent fluids. It is unlikely that the flow from the lower levels would be uniform so the intruder should spread as waves with its front advancing more rapidly at some times than others (fig 5).

More importantly the intruder should follow a spiral as it spreads because it's traveling over a rotating reference (Coriolis Effect)(fig 6). If the hypersphere is rotating in a West to East direction, the


Hypershere rotates from West to East. The Intruder above the equator spirals clockwise as it spreads.
fig 6

intruder above the equator should follow a clockwise spiral. If it were below the equator, it should follow a counterclockwise spiral.

Neither, space nor time, existed for this 3D universe until the intruder began its intrusion between the upper and lower fluids. All universal constants were determined by the properties of the intruding fluid (density, speed of intrusion, etc} combined with the properties of the upper and lower fluids. If any of these properties were different it would be a different universe.

So the picture here is that of the 3D interface becoming well established after a massive turbulent birth and then settling of the layers. The massive 5D bubbles that collapse as the new 3D interface is established should leave their mark on the 3D interface as a sponge like superstructure with gravitational indentations creating walls between bubbles. The energy present at the birth could ultimately redshift to that of a microwave background as this universe expands.

Layers on the parent 5D hypersphere

fig 7

Figure 7 is a diagram of the 5D hyper sphere region that contains the Shear dependant (SD) universe The 5D hyper sphere is made up of many layers. I envision each to be many times thinner than an iridescent oil slick in our universe. This makes at least one spatial dimension apparently to be inaccessible and possibly have an apparently “rolled up” or hidden dimensional contour similar to that of our universe. A major difference is that the thickness of the oil slick in our world is approaching the size of its material unit or molecule, but the 5D layers do not. This is because I imagine the size of it units (hyperatoms or molecules) when compared to the thickness of the layer would be similar to that of a water molecule within the deepest region of an earthly ocean. The intruder's disparity in size could possibly be even greater. What's more, I envision these hyper atom or hyper molecules to be tightly packed without any equivalent to an electron cloud and to be denser than anything allowed within our physical laws. Our atoms are mostly space but these hyper atoms fill their 5D space completely. I am describing an immeasurably large object (the hypersphere) that consists of immeasurably small objects. And layers that are unfathomably deep or immeasurably thin depending on your point of view. If you are the size of a component unit, the intruder is unfathomably deep. If you are the size of an 3D universe's occupant, the intruder is very much thinner than an oil slick. A rationalization will be presented below that suggests that layer thickness could be measured in what is describe in our universe as Plank lengths

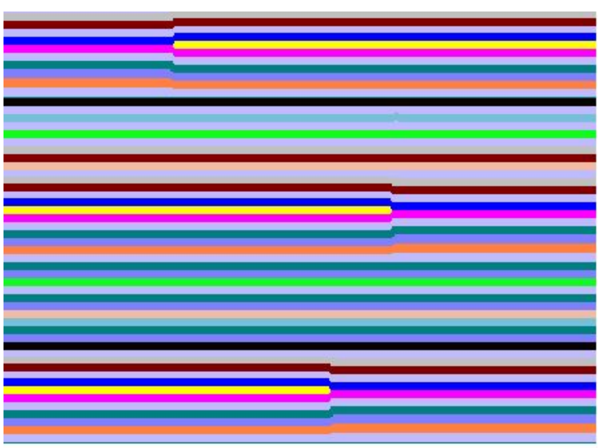


fig 8

Figure 8 is a diagram showing multiple intrusions and possibly multiple universes. Each would have different constants. These constants and laws would depend on the properties of the involved fluids and the rate of the intrusion. They could be radically different at each 3D interface For example the density of the fluids could be such that there would be equal amounts of matter and antimatter or the speed of transverse waves (light) would be different.

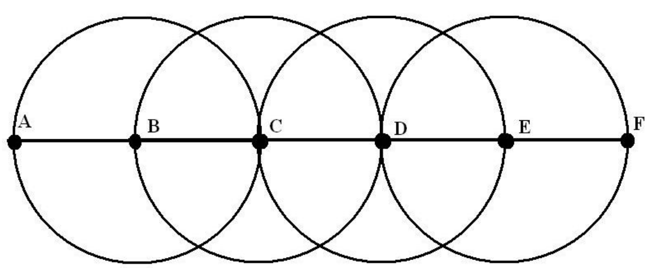
Although the dimensional thickness of the layer is miniscule, there is plenty of room for activity within the other four dimensions. And because of this thinness in one direction all of the diagrams below are highly exaggerated or distorted.

The yellow layers in the diagrams are intrusive. Columns of intrusive material could disrupt portions of other intrusive layers without interfering with their universal activity if the column was sufficiently distant from the advancing perimeter. If one invasive layer is penetrated by the column of another invasive layer its 3D interface would only be disrupted in the region of contact. It may even be able to advance beyond the obstructing column, repair its 3D interface and continue in its advance.

Some considerations regarding universal expansion

If we use the expanding cosmic horizon as a reference, its diameter could be of a great circle of the expanding system.

The Scientific American article, "Does the Multiverse Really exist?" (Ellis, George F. R , August 2011 Volume 305, No 2 Pages 38 to 43) suggests that the cosmic horizon (which incorporates universal expansion and the distance light has traveled since the big bang) is 42 billion light years in any direction. (The light from any object outside this cosmic horizon has red shifted to extinction.) This suggests that the diameter of our cosmic horizon from one side to the other is 84 billion light years. This is all that we can ever see. This is the observable universe.



The circles represent cosmic horizons
Observer A can see observer B but not C,
B can see A and C but not D,
C can see B and D but not A or E,
D can see only C and E,
E can only see D and F

Fig 9

Figure 9 suggests how this might work. It assumes that the different observers have maintained their relative positions since the big bang (or swoosh) but have moved with universal expansion. Each observer can see only other objects within his cosmic horizon, nothing outside.

The Scientific American article also makes the assumption that the observable universe is the size of our universe. This may or may not be true as suggested by the illustration.

This suggests that of the size of our "observable" universe is about 26 billion parsecs. (84,000,000,000 light years divided by 3.26 light years, which is equivalent to one parsec, equals about 25.8 billion parsecs). The latest measurement of universal expansion is around 73 kilometers per second per 1 million parsecs (ESA/Hubble Information Centre. "Cosmic lenses support finding on faster than expected expansion of the universe." ScienceDaily. ScienceDaily, 26 January 2017. <www.sciencedaily.com/releases/2017/01/170126132624.htm>). We really don't know this value but I had to choose one for illustration (See http://www.forbes.com/sites/startswithabang/2017/01/12/we-still-dont-know-how-fast-the-universe-is-expanding/#1f9d0aaf3a93)

Using the Scientific American estimate this suggests that there are about 26000 one million parsec segments in the observable diameter of our universe. 26000 times an expansion rate of 73 km per second is 1898000 km/sec or 6.327 times the speed of light. So this would be the total the expansion rate for a universe of this size.

For now I will apply these values to the SD universe. Our universe in has a diameter whereas a great circle of the expanding intruder universe (as the edge of a 5D pancake) *is a circumference*. So if I apply these values to the SD universe, expansion of what is our universal diameter becomes an expansion of the SD universe as a circumference. If we use these values as the SD universe's circumferential expansion rate (6.332 times light speed) we come up with an outward or radial speed that is about 1.007 times the speed of light (6.332 / 2π = r) (Fig 10).

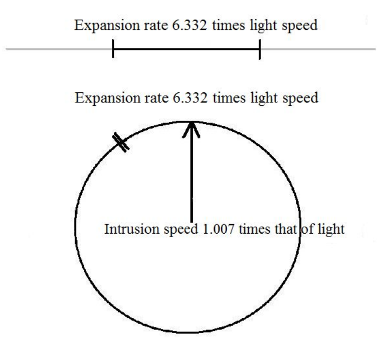


fig 10

These figures are based upon the "observable" universe. Some estimates propose that our universe is much larger. This suggests that the intrusion which is responsible for the expansion of the SD universe could be very much faster than 1.007 times light speed.

Ideas suggested here will be covered more completely in the section "SDU Gravity" But for now I want to point out that the rapid intrusion, would cause, any objects at the 3D interface that produces indentations, to experience some degree of force from the backflows of the upper and lower fluids, In the SDU, G(gravitational) would have an incremental trigonometric component to match the incremental slope of the indentation relative to the back flow that might be more apparent with extremely large masses such as galaxies.

Shallow indentations experience very little. Those with deeper indentations experience more. Indentations whose walls are approaching parallel to this back flow could experience all of its force and light would be swept towards the indentations center. (Actually, if the intrusion was as rapid as suggested above, it would be swept to the indentations center well before it was subjected to the backflow's full force.)

These indentations experiencing the back flow of the upper and lower fluids would become "virtual wells". The spatial interface within some of these indentations could very well have a slope with an angle in which the fraction of the backflow along this slope is greater than the speed of light. In other words, these slopes would only need to be very small deviations from the "horizontal" 3D interface to have substantial effect.

Light could not escape from these "deeper" virtual wells. Therefore, all of the objects *that can be viewed* within the SD universe must have indentations less than this. It also implies that these very shallow but wide indentations could have the potential to accumulate objects without interfering with shear.

At this point these ideas do not suggest anything about the actual depth of the more pronounced indentations only that their contents would not be visible within 3D space.

In spite of this speculation, the occupants of the SD universe cannot be sure what the actual values are. Their observable universe would include only those regions where light has not been modified to extinction by expansion. Beyond this nothing is visible and the actual speed of the intrusion may be indeterminable.

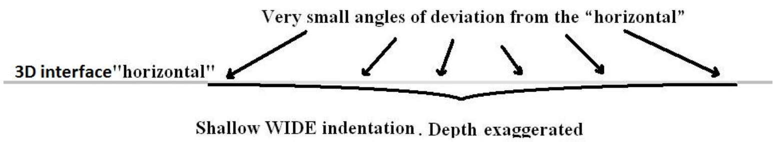


fig 11

The origins of these wide shallow indentations (fig 11) will be described as the drag of shear vortex accumulations on the 3D interface before they escape up the adjoining 4D interfaces.

Consider the advance of the intruder to be analogous to our "dark energy" and the indentations with their backflow of upper and lower fluids to be analogous to our gravity. This gravity could not exist without the intrusion (dark energy). Whereas the dark energy and gravity are two different competing forces (as viewed) within our universe. So this is one contrast between the Shear Dependant Universe (SDU) and our universe.

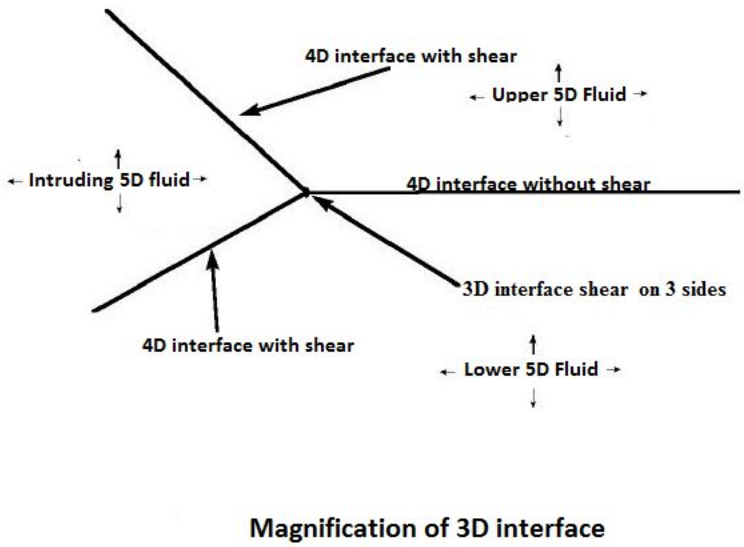
This suggests other consequences of this relationship between the intrusion (dark energy) and gravity.

One is that if the intrusion accelerates, gravity would intensify because the upper/lower fluid backflow would intensify. This type of dark energy could not overpower this form of gravity because it causes gravity.

This may be a testable effect. For instance, if all other forces remained the same, during times of slower intrusion, proto stars may collect larger volumes of hydrogen before initiating fusion, because here, gravity is also slightly weaker. Larger volumes would be required to create the pressures conducive to fusion. In this situation, the volumes of shear vortices (see below) cause less drag on the advancing front, so the virtual wells of the advancing 3D interface are not as deep because the backflow is not as intense.

Another consequence has to do with irregular patterns for the intrusion. I started out implying that the intruders advance was uniform. It doesn't have to be. Some regions of the 3D interface could lag behind others. The regions between the more advanced universe and the centers of those lagging behind would not be totally perpendicular to the direction of the intruder's advance. And as a result, they would create drifting of 3D objects towards their centers, similar to the “great attractor” in our universe.

And so the 5D hypersphere would be the parent or foundation for this version of a universe.



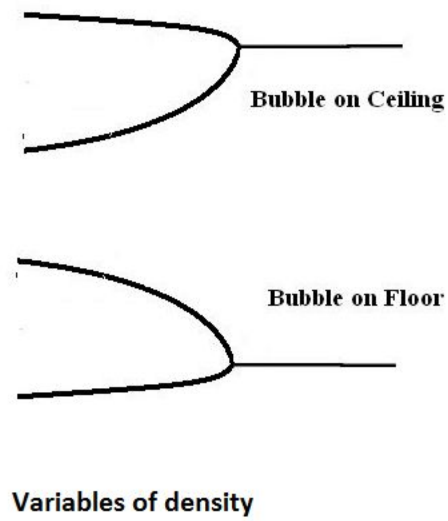


Fig 12

(All diagrams are highly exaggerated and ignore the thinness of the fluids).

The SDU exists at the 3D interface where the intruder separates the other two 5D fluids (Fig 12). It is unlikely that the intruder's density would be such that it splits the fluids evenly so the actual configuration would be more like an advancing bubble on a floor or ceiling. This will be a significant factor in the properties of vortex swarms in that while I envision the difference between the upper and lower contours to be very small, it should be sufficient to allow certain energy configurations to be predominant. Therefore, this universe should have more matter or antimatter.

Shear should occur where the intruder meets the upper and lower fluids because the intruder fluid moves differently from the other two and rubs against them. The shear could generate vortices.

For the most part, these vortices would be random in occurrence and direction at the 3D and 4D interfaces. But they might take on uniform directions and have longer contact with these interfaces wherever there is torque or other confining configurations of the interfaces. Mechanisms that might allow this will be suggested below.

I want to allow turbulence on both sides of affected 4D interfaces so I set the condition that the densities of the three fluids, to be very close. That is, the chances would be greater that shear would cause turbulence in the less dense fluid but would still allow a nearly equal although slightly lower chance that it could also occur in the fluid with the slightly greater density. If this is allowed, the concentrations of vortices generated within each fluid should be roughly equal. Under these conditions and speed (1.02+ times light speed suggests a high Reynolds's number see above) the flow is also much less likely to be laminar. Allow that the combined factors (the densities and viscosities of the fluids, the high speed and relative motion of the intruder to the other two fluids, etc.) would cause both sides of the interfaces between the intruder and the other two fluids, to seethe with an extremely fine and dense textured turbulence. This turbulence could consist of tiny rotating hyper columns of fluid and other waves. It would be "fine" in that the hyper columns or vortices within this turbulence should be extremely smaller than what might be perceived as the basic units of the 3D SD universe. It would be "dense" in that they would occupy every permissible volume and hyper volume that conditions allow, at the interfaces. They should be constantly created and dissipated at the interfaces of all three fluids. Each time an isolated vortex forms at the 3D interface and is swept away by fluid motion along the connecting 4D, it at first creates a prolonged twist (torque) around the 3D interface. Then as it is pulled away from the 3D interface its energy is left behind in the form of a 3D interface twist rebound (torque) in the opposite direction. If there were no shear this wave would rebound and re-twist until its energy is dissipated along the connecting 3 and 4 D interfaces but I suggest below that the presence of shear provides a mechanism to replace or limit this energy loss. Under the right conditions these waves could potentially reinforce and interfere with each other. This turbulent field of tiny objects will provide continuity to any established systems of resonance in much the same way the white noise of rushing air at the mouth piece of a flute provides continuity to the resonant volume within the flute.

This is the primary field; an ocean of energy which is similar to the Higgs field in our universe except the rotation of vortices in the field above the horizontal interface is opposite those below. This background is the stuff from which everything will be made: matter, anti matter, various photon like patterns, and various fields (gravitational, electrostatic, magnetic, polarized shear etc.). It would also have many characteristics similar to our quantum energy of the vacuum in that “particle like” objects would be continuously created and destroyed.

This 3D edge of the advancing interface has some things in common with a wire vibrating in a breeze and shedding vortices downwind

Speculation regarding the Wakes

Wakes on the 3 and 4D interfaces are an essential concept in this model.

Speculation regarding them can be developed by observing properties of our magnetic fields and how vortices interact at interfaces between adjacent fluids such as waterspouts between water and air. They are the disturbances of the interfaces as vortices and vortex systems pass over them.

Rotary motion is suggested by the right or left hand rules and lower pressure suggested by the attractive force.

The lower pressure and rotation on one side of an interface should be felt by fluid on the other side. This fluid would take on some of the motion but will only form a separate vortex or vortex system if there is sufficient torque (energy).

In this model wakes are attractive when vortex rotary motion has the same orientation.

The rotation of the region of the wake must be compatible on both sides an interface to be attractive. Wakes become repulsive when rotary motions on opposing sides of an interface are of opposite orientation because they form turbulent interference at the 3D interface where they meet.
Thus rotational motion at this interface can work with or against the rotation of vortices, causing collection or dispersion of vortices or vortex systems.

A magnified view of the background

Before continuing I need to suggest rules regarding the interaction the different species of vortices at each interface. Then I can provide the concept of circular / tubular resonant vortex "swarms"

In this universe there are four species of vortices created at the 3 and 4D interfaces· They occur on both sides of the upper/intruder interface and both sides of the intruder/lower interface.

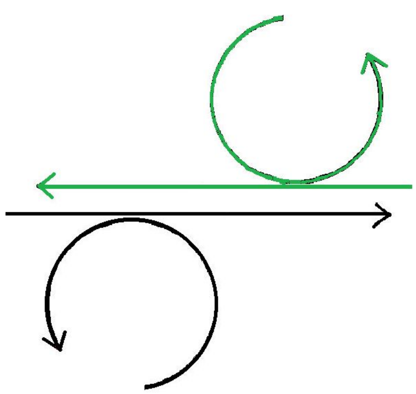


fig 13

These are some of the ways as to how these vortices might interact with the interfaces and each other. The vortices formed on either side of an N-1 interface would rotate in the same direction because, where they meet, each fluid tends to form a vortex compatible with the motion of the other fluid and for each of them the motion of the adjacent fluid is in the opposite directions, it is also against the opposite sides of the vortices. Both rotations in the illustration in Figure 13 are counterclockwise. The green vortex is green's response to black's motion and the black vortex is black's response to green's motion. This results in vortices with the same rotation.

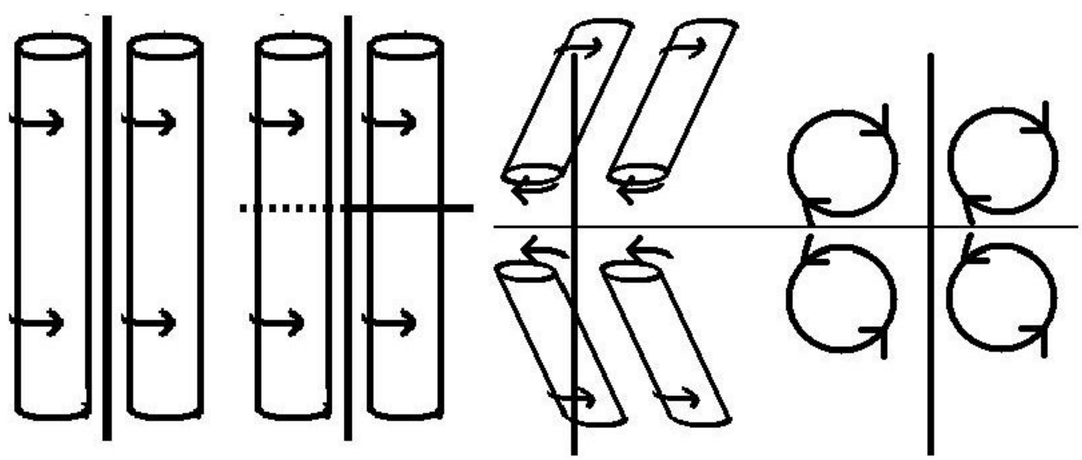


fig 14

Let’s also think about what the situation would be if there was no horizontal 4D interface, between the upper and lower fluids. This configuration has the intruder moving against a single hyper volume as in figure 14's first two diagrams. These picture unbroken columns of fluid moving along either side of the 4D interface, each with vortices of the same rotation when pulled in the same 4D direction.

Now if we add a 4D interface, perpendicular to the first (second diagram), we create additional vortices that rotate in the same direction but only when they are stacked one on top of the other. (The dotted line represents the break in the intruder's contour caused by it’s interaction with upper and lower fluids. It would behave as though it were an extension of the horizontal). These vortices cannot pass through the 4D interfaces. They are pulled by the flow of the moving fluids only along or away from them.

If all vortices are pulled in the same 3D direction, those above the 4D horizontal interface will rotate in a direction opposite those below. Vortices on either side of the vertical 4D interface will still have the same rotation.

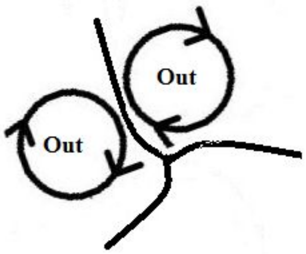


fig 15a

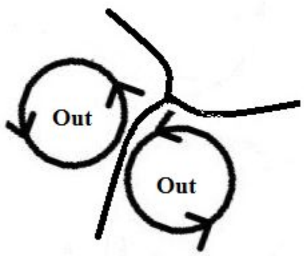


fig 15b

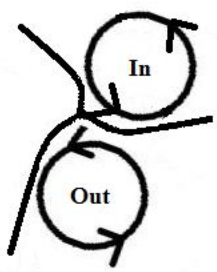


fig 15c

Figures 15a & 15b suggest how the 4D interfaces around 3D interface would twist while vortices contact it.

Fig 15c shows how vortices of opposite rotation could share the same wake if they travel in opposite directions. This will allow vortex swarms on all three sides of the 3D interface to be bound by a single ring of torque.

It is unlikely that the horizontal interface on the right before the intrusion would experience much in the way of distortion but the distortion of the other interfaces will be shown to be very important in pattern formation and properties of shear vortices.

These vortices are pulled away by the back flows that are created by the intrusion. But they are also held in contact with and advance along the 3D interface through their own torque wakes and the cumulative torque patterns of other vortices near them. The back flow always wins out in the end but their time spent at the 3D interface and how far they travel varies with their environment.

The diagrams also suggest the distortions to the 3D interface produced by individual vortices. This will also apply to vortex conglomerates or swarms when these concepts are developed later.

These contours and their associated torque would be prolonged as long as the vortices or vortex conglomerates were contacting the 3D interface. Anything above the "horizontal" 4D interface would twist the 3D interface or apply torque to the 4D interfaces in directions opposite those below when traveling in the same 3D direction. Individual vortices also contribute a rebound twist or torsion wave to the 3D interface when they depart. These rebound twist can be influential, but only if the ambient torque allows it. This will be covered further below.

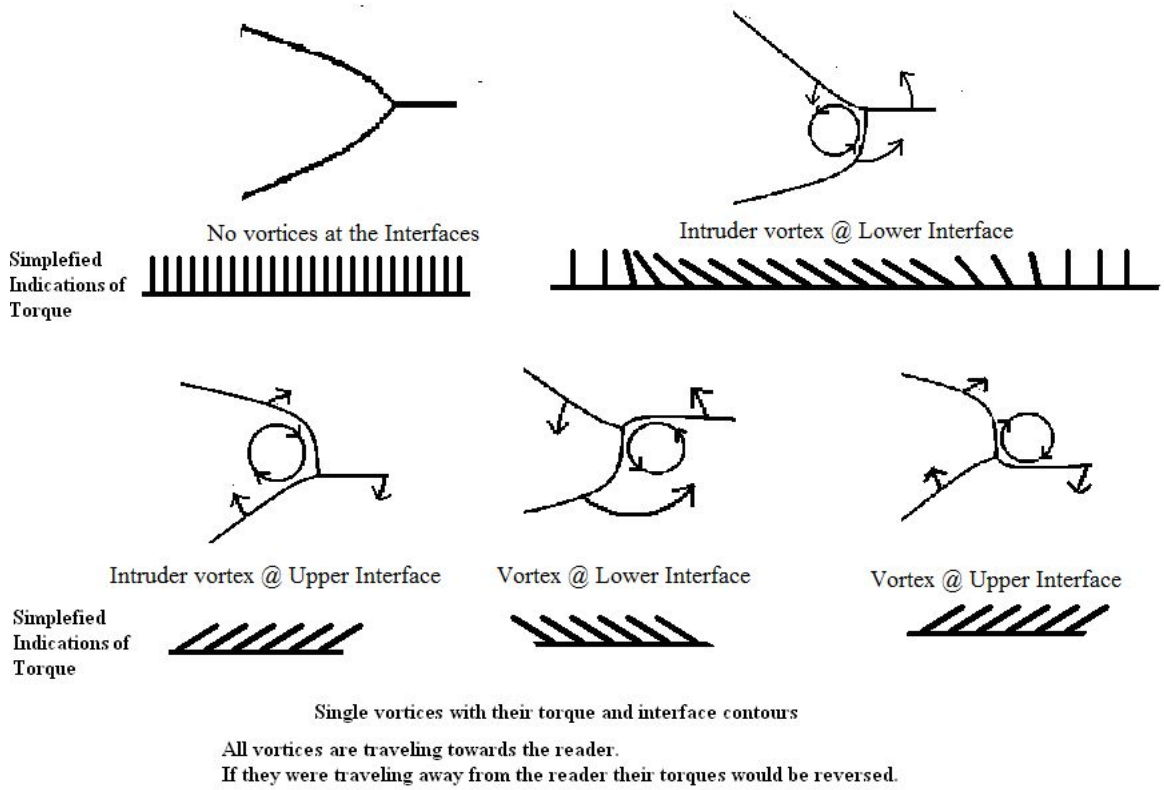


fig 16

The diagram (fig 16) suggests the distortions produced by individual vortices. They will also apply to vortex combinations when that concept is developed later. It will be suggested below how swarm formation allows these combinations to exist but for now I wish to emphasize that the vortices don’t simply create torque but also change the shape of the intruder's leading edge. The hashed line diagrams indicate the torque created by single vortices. These patterns will also be applied to conglomerates of vortices with the same orientation.

These contours and their associated torque would be prolonged as long as the vortices or vortex conglomerates were contacting the 3D interface. Anything above the “horizontal” 4D interface would twist the 3D interface or apply 4D torque to an interface in directions opposite those below.

Individual vortices also contribute a rebound twist or torsion wave to the 3D interface when they depart. These new twists are opposite the ones present while the vortices were still in contact with the interface. As they leave 3D interface they would pull and continue to twist it. When they break free they would allow the interface to “snap” back with an opposite twist. These rebound waves could have high amplitude but very short duration. If there was no shear, their range would be short because they are that portion of the torsion wave that could also be dispersed along the connecting the 4D interfaces. But these twists can also “seed” other vortices created by the fluidic shear. I am suggesting below that this process allows these twists to travel great distances along the 3D interface as SDU photons.

An intruder vortex at the upper interface with energy above some threshold is being pulled away from the 3D interface by the flow the upper fluid as it travels between them. This vortex had a 3D orientation and direction while it was attached to the 3D interface. When it leaves, its rebound has a mirror 3D orientation and rotation. In other words the resultant wave is not flat. It doesn’t disperse in all directions equally. The wave travels only in one direction. It would be expected to spread out as the arc of a sphere but it is further confined by polarized shear .

Shear is present everywhere. Vortices are being created everywhere but I am suggesting a property in which they can have preferential orientations where a 3D interface is already twisted or subjected to torque. So when the 3D interface untwists it seeds other vortices with opposite 3D rotation traveling in the same direction. This is possible because the connecting 4D interface is perpendicular to all directions of the 3D interface. This seeding allows the vibrating torsion wave to continue in its original direction as a train of alternating twists reinforced by vortices with alternate rotations. So when one group of vortices departs shear seeds another group with opposite orientation and the cycle is repeated continuously.

When viewed from 5D space this activity looks like a little zipper coming undone as the two vortex streams escape up the connecting interface(s) from the traveling wave (see Intro to photonic patterns below).

The presentation of vortices with opposite rotation is allowed at the 3D interface because although all of the intruder's vortices have an intrinsic orientation, the 3D axis of the vortices can have any orientation perpendicular to their rotation. A vortex or conglomerate with one 3D presentation or axis direction could be described as “up” or “down” relative to one with the opposite presentation or axis direction. They both could still be pulled up the same the 4D interface because it contains all of the 3D directions plus another.

Other linear vortex systems involving vortices in lower or upper combinations of vortex streams on different sides of the 3D interface will be described below. I will suggest some properties for these variations. I will also suggest a reason for higher frequency in response to higher energy (torque against a resistant media), and consider the possibility for different vibratory modes.
So for now the description of the intruder's universe is simply that of rotating, vibratory string like vortices arising from shear and organized by torque. Their presence at the 3D interface would be viewed as moving points that appear and disappear or as transitory minuscule one dimensional rings sweeping out regions of the 3D interface.

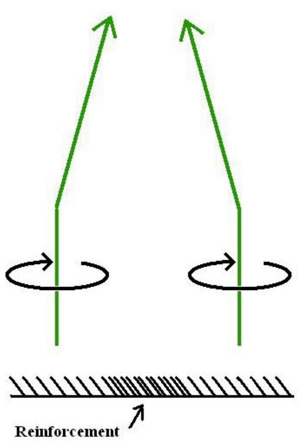


Fig 16a

Picture a vortex traveling along the 3D interface creating its characteristic wake. Allow another vortex traveling in nearly the same direction and presenting the ***same*** 3D twist to come near this vortex (fig 16a). The torque of the wakes at the interface between them intensifies. When the second vortex encounters this wave it will be accelerated by the twist of 3D interface and move towards the volume with higher compatible torque. The wake of the first vortex compliments the wake of the second and the second tends to slip into the established wake modifying its own direction. The second vortex is also having a similar effect on the first so they are moving towards each other following the torsion wave contours at the 3D interface. An important point is that this reinforcement will also accelerate these vortices. They will travel further before escaping their 3D attachment. They accelerate because as they move closer to each other they are moving into space with a higher compatible torque so for each of them the 3D interface is actively twisting. The lines at the bottom of the diagram, suggest the shift of the connecting 4D interfaces caused by the presence of the vortices. As the vortices approach each other the 3D interface between them experience greater torque so they each tend to move into that wake.

<u>Do not consider the rotations around the arrows to be "meshing or not meshing". It is the torque wake at the 3 and 4D interfaces that determines their behavior</u>.

This property of vortices moving together when they have the same 3D presentation is the dynamic that allows torque to become concentrated to form the structures described below.

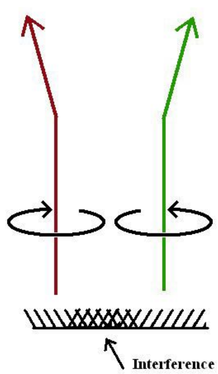


fig16 b

Any approaching vortex traveling in the same direction and presenting the ***opposite*** 3D interface rotation (fig 16b) will decelerate and turn away. It decelerates because the incompatible wake of the first vortex interferes with or neutralizes the wake of the second vortex. The vortices turn away from each other because they always move in the direction of the higher compatible torque which in this case is on the side away from the interference between them. They would move away from each other following the torsion contours around 3D interface.

A very important point as that this interference will also decelerate these vortices. They will not travel as far before escaping the 3D interface. They decelerate because the torque around them at the 3D interface is decreasing while they are receiving more energy from the shear at the 4D interface. This creates conditions that encourage vortex motion along the 4D interface away from the 3D interface.

As a reminder; the arrows designating rotation should not be seen as "meshing or not meshing". It is the torque at the 3 and 4D interfaces that determines their behavior.

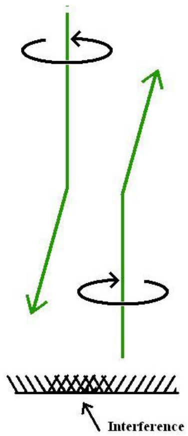


fig 16 c

Vortices that have the same rotation and wake when traveling in the same 3D direction would have opposite 3D twists and wakes when traveling in opposite 3D directions. They will tend to move away from each other and decelerate. (fig 16c)

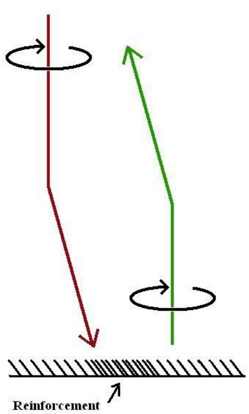


fig 16d

Vortices that have the opposite rotations and wakes when traveling in the same 3D direction will have the same 3D torque presentation and wakes when traveling in opposite 3D directions and will tend to move towards each other and accelerate (fig 16d)

At this point in the dialog some readers may see a connection between the characteristics of these vortices and those of the legendary "monopoles". This is an interesting observation except the vortices do not have the mass as predicted for monopoles. It will be suggested later that they also have some characteristics of the Higgs boson except again they do not have the mass predicted for the Higgs. This is because they generate mass by their huge accumulations in response to torque.

This applies to both gravitational and inertial mass.

About vortex response to torque in general

Re imagine the 3D interface as winding and unwinding as a wave of torque approaches and then leaves the region. Just as something floating on a plane rises to the crest of an incoming wave and then immediately starts to fall as the crest passes so shear vortices attached to this 3D interface move to match the direction of motion generated by an incoming wave of torque as it winds up the interface. Once it reaches its maximum (crest) it unwinds in the opposite direction. Vortices attached to the interface escape up the 4D interfaces or reverse their orientation. All new vortices maintain this orientation until the twisting interface meets the opposite crest. (See Polarized shear, Figures 17 a & b below)

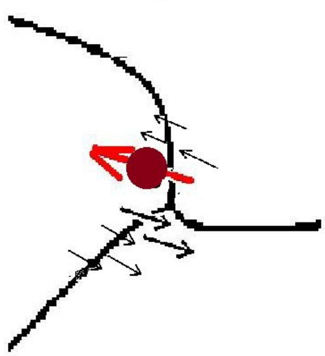
. It should not make any difference as to the amount of interface displacement. The winding and unwinding should affect all shear vortices consistently. Vortices with opposite rotations should have opposite orientations.

If shear vortices approach a region of high torque they experience the same twisting effect as that of an approaching wave. They take on the appropriate orientations. If for some reason they are forced to move away from the same region of torque they take on the opposite orientation. This would happen if a shear swarm is pulled through a torque field by outside forces as when a wire passes into and then away from a magnetic field.

The basic rule is that for the most part nothing is attracted to or repelled by anything else in the SD Universe. Things simply follow the contours of the 3D interface.

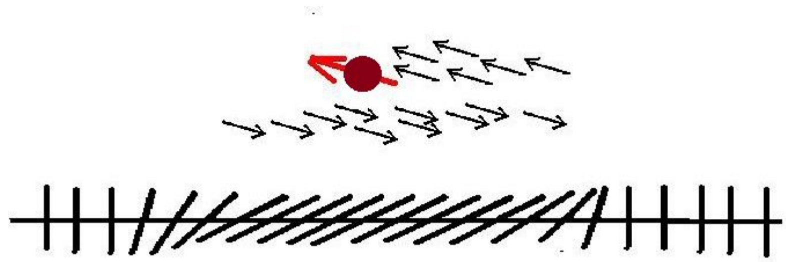
I could refer to the background shear as a SDU gravitational electromagnetic (GEM) field because the drag vortices exert on the advancing 3D interface will ultimately be described as creating effects similar to our gravity. And polarization of the background vortices by the presence of torque will be considered to be organized exceptions in its otherwise chaotic field. In this context they become finite organized fields within the pervasive chaotic shear field. The individual vortices within these universal fields have some properties similar to the Higgs particle of our universe but are actually much more versatile.

Polarized shear



Concentrated vortex system in motion and consequential directions of new shear vortices

fig 17a



Concentrated vortex system in motion and consequential directions of new shear vortices not showing interfaces

fig 17b

The diagrams (figs 17a and 17b) above portray a concentrated intruder vortex system at the upper interface contacting the 3D interface. Small, momentary, background shear vortices are popping up on all of the interfaces around it. These new shear vortices must take on orientations that are forced by the concentrated vortex system's torque. If they are above the horizontal interface they will be aligned with the primary vortex system and travel in the same direction because their rotations are the same. If they are below the horizontal interface they will have opposite rotations so they will be aligned with the concentrated system but will travel in an opposite direction. In other words these new vortices and the background will become “polarized”. The Figure 17a suggests torque at the interfaces around one point around the 3D interface.

I would need to draw thousands of diagrams of this torque configuration on the left and right, up and down, forward and back each with slightly less torque as their position is distanced from the center to show that the 4D interfaces contact the 3D interface everywhere and are stressed proportionally.

Fig 17b simply suggests that the greatest polarization is near the region of greatest torque. Again I have included only a sampling of the innumerable shear vortices being produced.

Unlike other transverse waves the intensity of torsion waves would be measured as torque not height. Objects that approach or (move away from) swarms respond as though 3D space is becoming more (or less) twisted and alter their velocities accordingly just as a piece of wood rises and falls with passing waves. This includes the individual shear vortices newly created around and further away from universal objects. They will tend to conform to the torque intensity present even if they are at some distance to the primary vortex pattern. In this context, 3D shear is polarized in varying degrees around the primary swarm. This is also to be expected regarding swarms in motion and the linear vortex patterns that will be described as the various species of photons. In other words, as these objects travel along the 3D interface, the shear adjusts to their passing torque as a concurrent wave of polarization. Evan if the objects are static, they are still immersed in a field of polarized shear.

These characteristics of the sheared interface will also support the waves of torque that travel away from swarms in motion. This torque is maintained by the alignment of the newly created vortices, as it moves through regions of the 3D interface.

There is a feedback effect that accompanies this polarized shear. Just as these free vortices respond to the torque patterns produces by light and matter, light and matter respond to the torque patterns produced by these waves of polarized shear.

The concept of polarized shear is an important element of the SD universe. It will be the primary constituent of all matter and energy.

Imagined Swarms

So within the SD universe the 3D interface at first expands chaotically as the intruder progresses between the upper and lower interfaces. However there is a phase when this expansion slows down and the earlier violent twists around 3D interface begin to subside. This universe loses its ability to confine the massive streams of vortices because they can not be supported by vortex wakes alone and the organizing intruder front is developing a SDU Plank limit. This limit restricts the allowed distortion of the advancing front and begins to break up the large quantities of energy. I am suggesting that these concentrated streams dissipate by shedding their vortices as more stable tiny tubular vortex swarms and sheet like photonic structures. As described above, some of these swarms occupy only one side of the 3D interface. Some share a common torque pattern on two sides. Some share common torque patterns on all sides of the 3D interface. Suggested configurations will be described below.

These tiny vortex swarms owe their existence to the resonances allowed by the collapsing twists of 3D space described as “intruder photons” below. I am now going to suggest one way these photons and the vortex swarms might interact with each other.

To illustrate I have isolated two resonant vortex streams from a swarm. This particular swarm occupies only one side of the 3D interface. These two streams are moving around a circle in opposite directions. They are on opposite sides of a common axis, moving counterclockwise but relative to each other they traveling in opposite directions and have opposite rotations. Think of them as forming a tiny cyclonic structure with an eye around the axis ending at the 3D interface.

In one stream a vortices twist and pull on the 3D spatial interface, distorting it somewhat. This twist is maintained as long as they remain in contact with the interface but as soon as they escape as a group, 3D space rebounds energetically untwisting in the opposite direction. It could twist past the point of equilibrium and continuing to twist in that direction until 3D surface tension slows it down and draws the interface back. If this were only the case this energy would be transferred to the adjacent 4D interfaces. It would leave the 3D interface. Instead shear could create a new aggregate of vortices from the initial rebound that prevents the energy from escaping. This is the first phase of a seeded photon that is traveling across the eye to the other side. New shear vortices join in as vortices of the photon escape while maintaining counter twists as vibration of the 3D interface. Each counter twist generates a new vortex aggregate until finally the photon enters the polarized shear on the other side of the eye. The first vortex aggregate compatible with the polarized shear remains and does not immediately allow a counter twist. It becomes part of the polarized shear. It was seeded. Now it is absorbed.

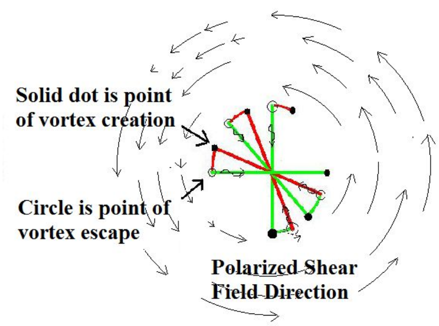
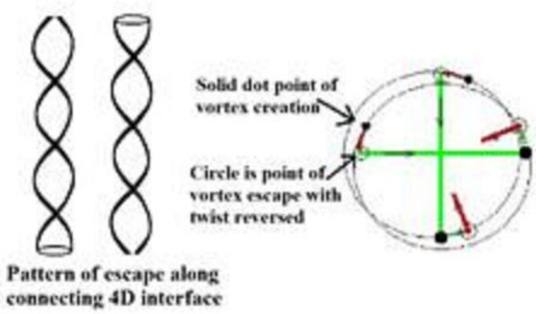


Fig 18

This should allow the waves of rebound torque to travel through the eye via seeded compatible vortex aggregates to the other side. Seeded vortices on all sides of the eye wall could transfer rebound torque back and forth across the eye. This white noise within a flexible cavity and can become the basis for internal resonance.

In the illustration (Fig 18) all vortices are on the same side of the 3D interface. A vortex aggregate escapes and shear generates another vortex aggregate with opposite 3D presentation from its rebound. The seeded vortex train travels across the eye with the rebound torque wave. These vortices become part of the eye wall. Then when this absorbed vortex leaves 3D space, it sends the resultant torque/vortex combination with polarity reversed through the eye which becomes part of the eye wall on the other side.

Allow vortices within the circle to move forward between the time of their creation and the time of their escape. This will cause the new position on the circle to be forward of previous vortices in the chain of events. Allow the interaction to be repeated continuously. (In the illustration green and red represent waves of opposite 3D torque or polarity traveling across the interior of the ring. The short curved lines represent how the 3D interface twists while the vortices are contacting it. The empty circles represent the escape of the vortices and the resulting reversal of the 3D interface wave sending a sheet like photon to the other side.



Two of many vortex streams occupying a single ring system. Black lines show each of their pathes.

fig 19a

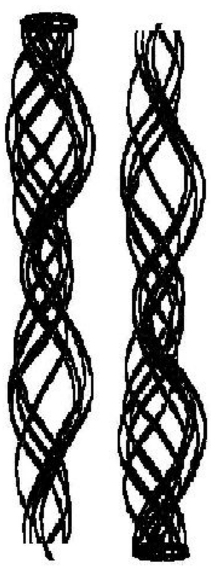
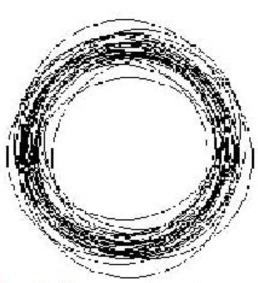


fig 19b



A cloud of resonant vortex streams.

fig19c

The diagrams in, figures 19a, b and c, suggest the flow of two vortex streams as they are created at the 3D interface and are then pulled away to flow up the connecting 4D interface. The first helix could be a pair with paths "up" the connecting 4D upper interface. The second could be a pair with paths "down" the lower interface.

The vortices would continue to exist after leaving the 3D interface because there is even more available sheer present at the connecting 4D interface. These columns are allowed because the 4D interface has all of the directions of the 3D interface plus one and we have many examples of columns formed within the 3D interface. The vortices that make up these columns are immersed in 5D fluids and as such affect the fluid motion and pressures. So I will sometime wish to concentrate on the columns 4D nature and at others on their 5D nature

And now speculate as to what might be some properties of a swarm. The diagrams (fig 19b and c) suggest the flow of vortex swarms as their vortices are created at the 3D interface and are then pulled away and flow up or down their respective connecting 4D interfaces. The first helix is a swarm with a path down the connecting lower 4D interface

The second is a swarm with a path up upper 4D interface. The helices would be a much more dense cloud of polarized shear that appears to be solid at the cylinder wall which I have been calling the eye wall (fig 19c).

All of the foregoing activity could create a white noise precursor to a resonant system within this flexible cavity. The size and shape of the cavity would determine the wave pattern that is intensified. This pattern could in turn reinforce or modify the shape of the cavity as system energy increases or decreases.

. As the energy of this eye wall increases the resonant photonic structures within would develop shorter wave lengths and its diameter would decrease. However, outside forces try to maintain a specific eye diameter. If the internal wave length shorten to one half this preferred diameter the cavity could expand to accommodate multiple cycles of this wave length. That is, the energy content of various swarms may affect and/or distort their diameters and shape of their fields at the 3D interface. This will be examined as contraction and in resonances within particle accelerators below.

Other considerations may be that the individual vortices within these eye columns and within the polarized shear around them may have particle like characteristics and as such generate the rotating columnar fluid structure (Fig 20a). All long term vortices within the columnar cloud would be moving around the eye in the same direction but in addition the forward side would be shifting towards a region a little ways outside the eye wall, because the most intense torque is near there (see SDU mass below). They are simply following the properties laid down above.

From a distance the cylindrical eye walls could possibly be seen as rotating strings, within huge rotating cloud fields (Fig 20b). These strings would be perceived as points within rotating cloud fields where they contact the 3D interface (intrinsic rotation)

The cohesiveness of these hypercylinders is maintained by 4D shear and should be sufficiently intense such that if their contact with the 3D interface should be distorted, broken up, or subjected to any interference they would still have sufficient cohesion to rebind to the 3D interface when and wherever the contours of the 3D interface allow. This concept is important because it suggest that a single swarm could have multiple potential 3D presentations at the same time, perhaps as a number of swarm fingers at the base of the primary 5D cylinder. This could be similar to the smaller vortices that

accompany several sides of tornadoes in our weather systems except these segments could occur on opposite sides of planes. Just as tornadoes rotate about a central 1D axis (line) 5D hypercylinders

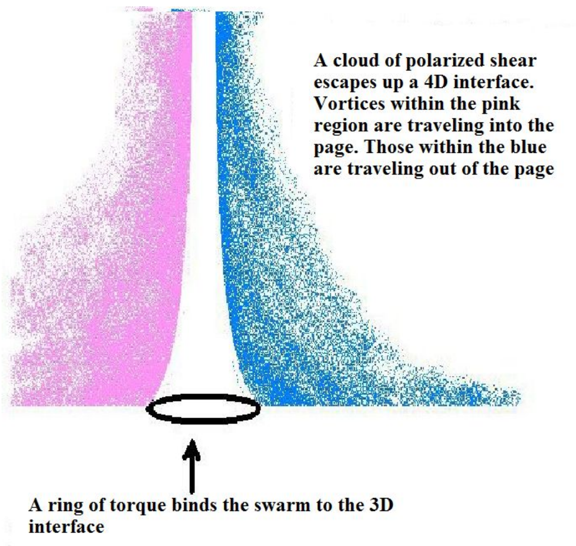


fig 20a

could rotate about the 3D interface (volume). Those swarms which share a common torque pattern while on several sides of the 3D interface (as described below, three quark configurations) are less likely do this. Their common torque forces them to move as a group. They can only move freely and have multiple 3D presentations if they receive enough energy to break away from the group.

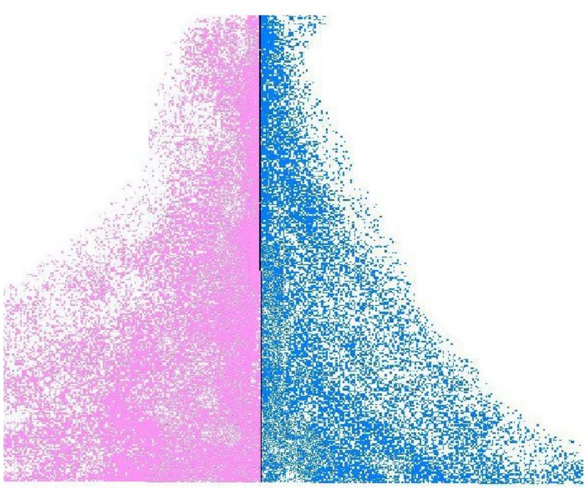
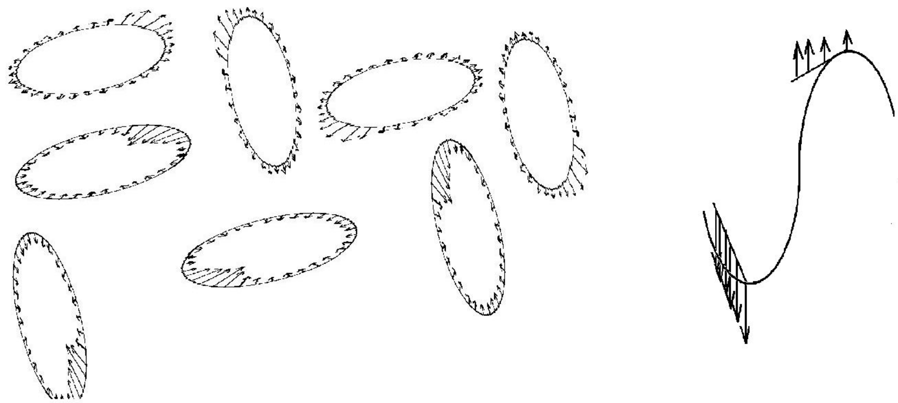


fig 20b

The description now is of one resonant vortex streams in a swarm. This is essential because it is the activity within the swarms that helps to hold these things together. Vortices in these swarms will be at different stages in their life spans. Newly created vortices will have characteristics of the torque already present. They will move towards and align with established vortices. So in this version of the SD universe, I envision columns whose bases at the 3D interface are seen as doughnut or toroidal shaped clouds of circular vortex streams held together by their resonant patterns, their torque wakes and their 4D hypercylinders. I refer to them as "swarms" because once they are established it would be impossible to determine which new vortices on one side of the doughnut were the anti vortices to escaping vortices on the other side however the internal resonances within them could very well influence motion and resonances with adjacent swarms and other aspects of their multiple 3D presentations. These would be chaotic systems with two regions of attraction or concentration. One is determined by their cumulative wakes at the 3D interface and another that results from the flow along the eye walls of their hypercylinders. They would be maintained by the ever present shear between the intruder and the other two fluids. They would be allowed on both sides of the intruder's two connecting 4D interfaces. The sustained waves from these streams could influence the lifespan and motion of newly formed vortices in other segments of the ring. The regions of attraction could be described mathematically as a fluctuating circle at the 3D interface and as a fluctuating cylinder along 4D interface or perhaps as an axis through the center of a cylinder. Theses rotating columnar clouds consisting of the individual shear vortices would be larger vortices in their own right. And behave as such.

The cumulative wakes should have an emergent property. That of constant pressure on one or more of the connecting 4D interfaces. This pressure could also be described as torsion waves maintained in the 90° position of their phase. That is, at its allowed maximum torque. The presence of the swarm persistently twists or deforms the 4D interface(s) around 3D space. As a swarm moves into a region, 3D space becomes more and more twisted to the point where it matches the torque pattern within the swarm. As the swarm moves out of the region, the 3D interface untwists back into whatever state of equilibrium it had before the disturbance



3D circular torque patterns for matter & antimatter, Arrows indicatw strength & direction of torque. They all have different planes.

Sheet like Torque pattern for SDU light

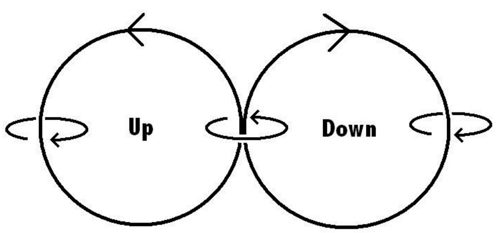
Fig 20c

Photons within this model are the linear sheet like siblings (Fig 20c) of the tubular structures that constitute matter (and antimatter). Photons and matter are both patterns of torque at the 3D interface that are maintained by the presence of shear. These photons will be described in more detail and enumerated as to types later when I discuss their properties with regard the interfaces involved, their energy, how far they could travel and how they might experience constructive and destructive interference

Some Imagined Structures - A Particle Zoo

The modified picture is that of a 5D cylindrical swarm with a persistent somewhat fuzzy doughnut shaped distortion where it contacts the 3D interface that can emit and absorb what has been described as sheet like SD universe photons. Depending on the circumstances some of these SDU photons pass through the eye and are absorbed by the eye wall on the other side of the swarm and some could escape and react with other swarms and likewise SDU photons that escape from other swarms could be absorbed by this swarm.

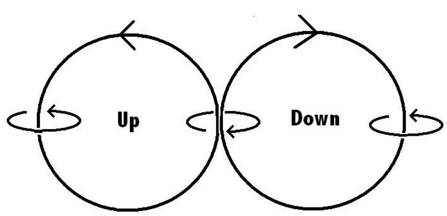
Now I will speculate as to the 3D interface presentations of some vortex stream/swarm configurations other than the simple single ring pattern that I presented above. The reader should remember that the sharply drawn circles actually represent the attractive region or "eye" within doughnut shaped swarms and that these swarms are actually the ends of rotating the 4D interface cylindrical clouds in contact with the 3D interface. This view is purely introductory and leaves out many other features contributing to these structures.



2 intruder rings at the upper interface

Fig 21 a

The simplest would be two rings each containing vortex streams all on the same side of the 3D interface. We will use two rings whose columns are within the intruder on the intruder/upper interface side of the 3D interface (Fig 21a). Both are above the lower interface/ upper interface horizontal. Shift one 5D column so that its 3D interface ring is flipped over within the 3D interfacial volume. This is allowable because all directions in the 3D interface are perpendicular to the intruder and these diagrams are after all only their 3D interfacial presentations. Thus the axis at the center of one ring travels "up" out of the page. The axis of the other ring travels "down" below the page but both stream up the same the 4D interface. Place these rings side by side. The vortex streams are traveling around the rings in opposite directions (one wake is ↑ and one is ↓) but the streams at their closest edges are traveling in the same direction and their wakes have the same the 3D interface presentation. Vortices formed within the rings here will be accelerated in the same direction and move closer together. The resonant patterns described above could overlap here and be consistent for both rings and be uniformly resonant with the vortices in the outer regions. The vortex streams at the two outer segments are also moving in the same direction to each other but opposite the direction of the inner segments. There could also be similar resonant patterns between other segments within the two rings enhancing the stability of the structure. It will be suggested below that any additional energy given to this structure which causes it to shift along the 3D interface will be maintained by this internal feedback. The resonant rings of two copies of a single vortex species could not stack on top of each other because their 5D columns traveling up the same side of the connecting the 4D interface keeps them separated. These columns are not allowed to occupy the same volume on the same side of a 3D interface. (It will be suggested later that columns on opposing sides of interfaces can, and much of the time do, occupy the same volume.)



2 intruder rings at the lower interface

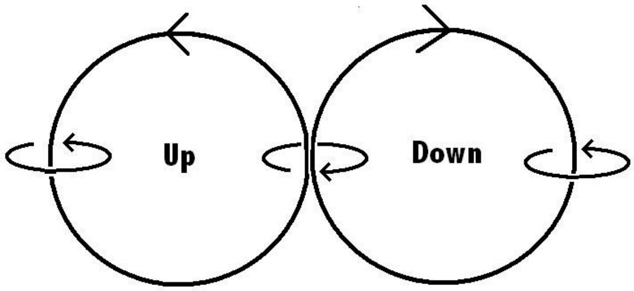
Fig 21b

The illustration on the left (Fig 21b) suggests a similar structure for two intruder systems at the intruder's lower interface.

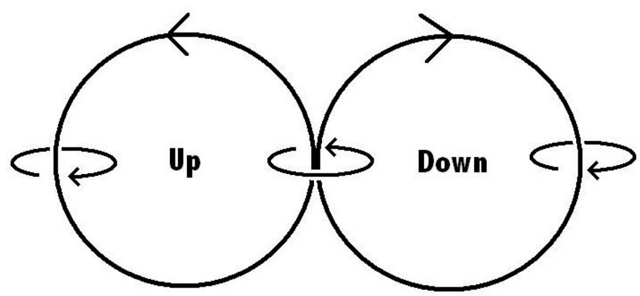
All of the same rules apply except the 3D interface presentations of the vortex streams have opposite 3D interface twists to that of the diagram above. They are below the lower interface / upper interface horizontal.

These, intruder at the lower interface, pairings and spin orientations will be important contributors to SD universal configurations. The torque at the 3D interface, where these rings touch, will be at times so powerful that it will override all of their other activity.

I will designate intruder at the lower interface swarms, Intruder_L (SDU electrons) and intruder at the upper interface swarms, Intruder_U (SDU positrons).



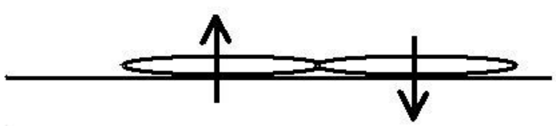
2 lower interface rings at the lower interface not within the intruder



2 upper interface rings at the upper interface also not within the intruder

Fig 22

The two diagrams above (Fig 22) are of lower interface and upper interface vortex stream ring pairs. Notice that the lower interface rings contribute the same pattern of twists to the 3D interface as the intruder at the lower interface rings. And that the upper interface streams match the intruder at the upper interface patterns.

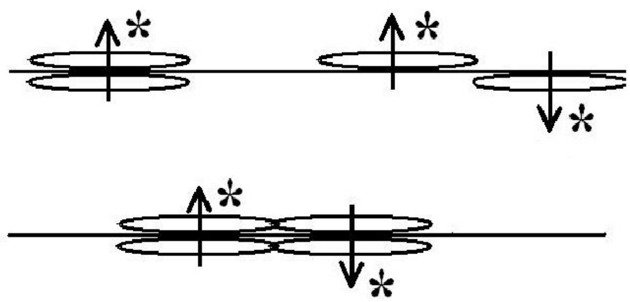


Vortex swarms on same side of the 3D interface

Fig 23

All of the ideas above suggest that under the right conditions vortex stream rings can resonate and thereby form attachment with other rings on the same side of the 3D interface (Fig 23). This will become more important in attempts to link larger systems.

Another factor that may contribute to the overall stability of a system is the shape of the intruding front as it travels between the lower and upper fluids (bubble on ceiling or floor). The difference in interface angles should contribute to a difference in the intensity of activity allowed at the various interfaces. However this effect could be somewhat softened by the presence of the vortices themselves. Wherever there are vortices present, there should be small indentations in the advancing front. This is because when these fluids are forced to travel as turbulence instead of in a laminar flow, they must travel farther. Increased speed compensates but since the vortices still pull on the 3D interface before they actually escape up the 4D interface, they exert drag on the advancing the 3D interface. These are places where the angle of the advancing intruder is blunted.



Vortex swarms on 2 of the 3 sides of the 3D interface

Fig 24

The above concepts segue into two partition systems occupying two of the three sides of the 3D interface (Fig 24). They can, when conditions allow, form the side by side connections similar to the systems that are on the same side of the 3D interface. But often they will contact **the same volume** of the 3D interface on either side. The two configurations could also allow resonant activity between multiple two swarm systems but they must follow the rules of the 3D interface orientation as described above.

I have asterisks with the orientation arrows because if the both systems are above

or below the lower / upper interface horizontal, they have obvious rotation. This is because the intruder$_U$ and upper interface swarms both rotate together in the same direction. Likewise intruder$_L$ and lower interface swarms also rotate together but in a opposite direction.

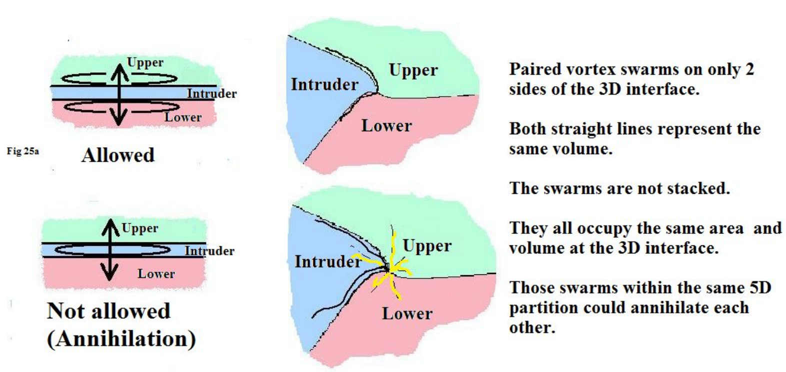


Fig 25a

Figure 25a shows two of a number of possibilities for two swarm systems. It should be noted that when an Interface$_L$ swarm is paired with an Interface$_U$ swarm (two quarks) they rotate in opposite directions even though they are following the same resonances and torque pattern at the 3D interface. They can do this because they are on opposite sides of the interface and do not actually touch each other. The arrows are axis directions. This could be a major configuration of matter within the SD universe similar to our "dark matter". It would be undetectable because there will be no apparent the 3D interface rotation and also there is no involvement with the intruder. Lower or upper interface swarms paired with intruder swarms would have charge, be easily detected and have definite rotation. It will be suggested below that most forms of energy involve waves engendered by the intruder configurations, either alone or in concert with lower interface and/or upper interface structures. Without this intruder involvement, all configurations of these lower and upper interface swarm pairs will have little or no apparent differences in rotation and therefore no predominant torque for interaction. This will be expanded on in the sections "inertial mass" and "charge". Consisting of only two quarks they would be smaller than SDU hydrogen. (Search for first stars uncovers 'dark matter' ScienceDaily February 28, 2018)

These configurations should also occur with Intruder$_L$ (SDU positrons) and Intruder$_U$ (SDU electrons) swarm pairs. However Intruder$_U$ swarms paired with Intruder$_L$ swarms would both be in the same fluid on conjoined sides of the 3D interface. So they could be short lived, annihilating each other if their torque is not controlled by supporting swarms on the other two sides. This annihilation would also disrupt any swarms closely associated with them. This will become easier to visualize after discussion below.

This seeding of vortices of opposite rotation traveling in the opposite direction is not as crazy as it seems when one considers that a SD universe photon entering a region of high torque can seed vortices in any of the adjacent fluids. It is just more likely to do so in some fluids than in others. If the densities, viscosities, etc. are very close, the chances become nearly equal for all, and the shear available at any particular side of the fluid interface will determine vortex rotation and direction.

We can now involve all three sides of the 3D interfaces (three quarks). The diagram (Fig 25b) suggests some possibilities for a three swarm system. These swarms are not stacked. They all have intimate contact with the very same volume of the 3D interface. In the lower figure you can see that their cylindrical eyes travel along different sides of the connecting the 4D interfaces. They all are held in place by the very same pattern of torque. I show configurations that have either an Intruder$_U$ or Intruder$_L$ swarms. They are not totally equivalent. One situation is more likely to occur than the other because of the bubble on the ceiling or floor affect.

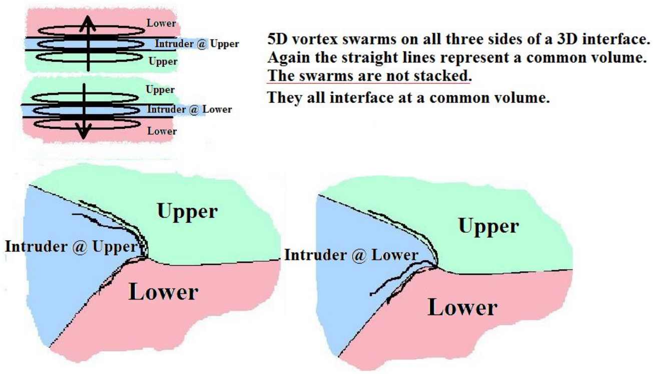
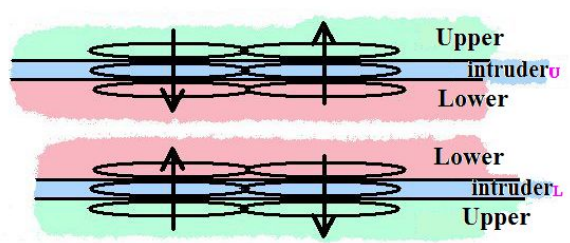


Fig 25b

Other observations by the above diagram are that the "eye walls" of these swarms might be described mathematically as fluctuating closed one dimensional lines (closed strings) where they contact the 3D interface and their cylindrical eye walls traveling along the 4D interfaces as fluctuating open one dimensional lines (open strings) when viewed from 5D space. Equations would be less likely to develop infinities because neither the swarms nor their vortices are point like objects.

This diagram (Fig 25c) suggests how cylinder's bases could interact or combine through common torque on adjacent sides. In this situation they must have opposite intrinsic rotation. They can do this because 4 and 5D interfaces are perpendicular to all directions of the 3D interface. The lower interface and the intruder$_L$ swarms will always rotate in opposite directions to the upper

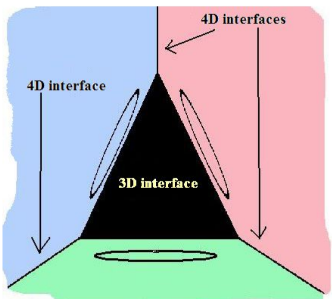


Vortex swarm trios can also overlap at their edges.

Fig 25c

interface and the intruder$_U$ swarms, but the apparent trio rotation will be that of the swarm majority. The up and down attributes only apply to the trio's relationship's with each other. They can be in any orientation as far as the 3D interface is concerned.

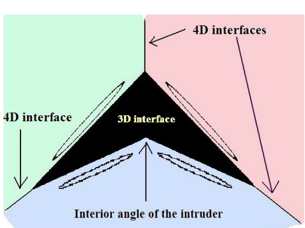
Each trio shows a definite direction of rotation because the 3D interface presentation of one swarm is overpowered by the double 3D interface presentation of the other swarms.



All three swarm rings are resonant within the same 3D volume.

Fig 26a

The intimate contact of the three swarms with the 3D interface (Fig 26a) should be extremely stable because they are all using the same torque pattern. When connected to similar systems the overlapping of their edges will also be very stable especially with some help from second opposite intruder swarm (see below). The term overlapping is a little deceptive. These structures are sharing the same torque pattern but when connected to adjacent conglomerates the shear at the interfaces can only support a specific number of vortices in any one region. The numbers of vortices present here are fewer than the numbers present elsewhere in the spread out fields. In other word it takes fewer vortices and their associated torque to maintain adjacent rings than it takes to maintain individual rings.



All four swarm rings are resonant and follow the same torque pattern at a common volume of the 3D interface.

Fig 26b

"But wait there is more" as they say on TV. This will happen with the dual intruder contribution. (Fig 26b)

An intruder$_U$ swarm will have a slightly different relationship with its 4D interface mate than an Intruder$_L$ with its the 4D interface mate. I refer to them as "mates" because the escaping streams of either lower or upper interface pairs travel up (or down) opposite sides of their respective the 4D interface. Intruder swarms exist in a fluid that has slightly higher density than the fluid supporting the upper interface swarms and is slightly less dense than that which supports lower interface swarms. This combined with the "bubble on the ceiling or floor" effect described above suggests that the offset angles between the lower and upper 4D interfaces would be slightly different. These angle differences would influence how likely an intruder swarm of either species would remain in contact with swarms on the other two sides. Allow for the purposes this discussion that matter in the SD universe can have trios with strongly attached intruder$_U$ swarms (Trio$_U$ SDU nucleonic matter) and its antimatter consists of trios with less strongly attached intruder$_L$ swarms (Trio$_L$ SDU nucleonic antimatter), then it is possible that the conditions, described above, could allow the trios (Trio$_U$s) that are matter to be in greater numbers than those that are anti matter.

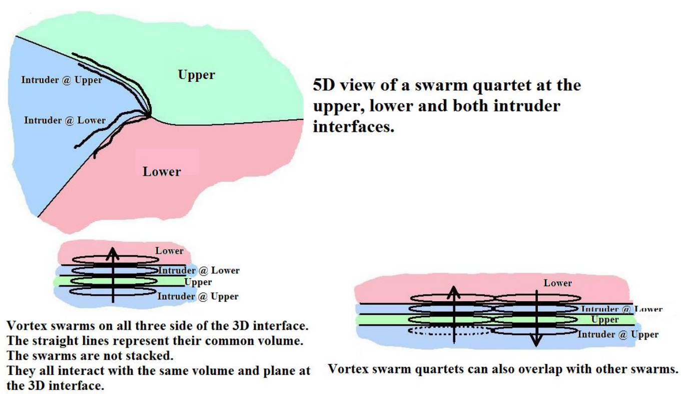
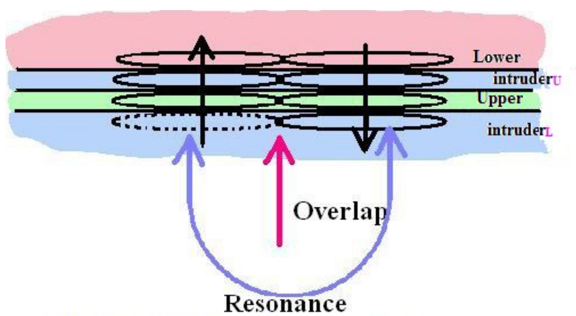


Fig 26c

The diagrams (Fig 26c) suggest other potential relationships. I cannot emphasize enough that all these swarms are contacting the same active volume of the 3D interface (straight black lines) in the same way four rods could contact the same portion of a rope stretched in parallel between them. They all touch the same length of the rope regardless of the angles of their positions around the rope. The same is true for these swarms. They all contact the same volume of the 3D interface regardless of the angles of their positions around the 3D interface. Thus two intruder swarms may touch the same 3D interface volume. One whose position is next to the lower interface and one whose position is next to the upper interface. The maintaining of the common torque by lower and upper interface swarms prevents the annihilation described above. Annihilation happens only in situations where the torque between intruder$_L$ and intruder$_U$ swarms is produced solely by them or if a Trio$_L$ comes into contact with a Trio$_U$. This will also be the case for Quartet$_U$ and Quartet$_L$ composites. Quartets are still three quark systems because there are only three fluid compartments

It will be suggested below that free intruder swarms can have a greater affinity for each other than for their cores. It could be a property similar to this that causes annihilation between matter and antimatter. It will also be suggested that intruder swarms are subject to momentary wandering.

Now back to the variations between intruder swarms. Their angles around the 3D interface are not symmetrical. One will have a greater tendency to participate in these three ring structures than the other. That does not mean that the second species can't participate. Only that it is less likely to. And when it does participate it may be likely to fluctuate between adjacent structures as in Fig 26d.



Vortices within swarms on the same side of the 3D interface are traveling in the same direction where they overlap. An intruder$_L$ is resonating between both structures.

Fig 26d

Tom Siegfried said in his article ("Quarks celebrate their 50th anniversary" Science News, January 30, 2014)

"While the simple picture of up and down quarks making neutrons is essentially correct, real life adds some confusing complications.

In quantum physics, as in spy movies, nothing is ever exactly as it seems. Within a proton, for instance, the two up and one down quarks are not alone. Quantum physics allows other quarks (known as "sea quarks") to pop in and out of existence. Within nucleons (protons or neutrons) some of those sea quarks are the strange (and antistrange) variety. Various properties of nucleons depend on how much strangeness they contain. It's an important factor, for instance, in experiments trying to detect the mysterious dark matter in the universe. Less strangeness in the nucleon reduces the likelihood of interaction with a dark matter particle, making detection more difficult.

For the last decade or so, determining the strangeness content of the nucleon has been a major emphasis in nuclear research, but the findings have not been consistent. Various reports (such as here, here and here) don't all agree with previous work. So experts are still struggling to figure out just exactly what protons and neutrons are made of."

This is understandable. If one considers the activity within a 5D partition to be equivalent to one of our "quarks", a SD universal neutron consists only of three "quarks" one of which is "strange" because one compartment contains two swarms. In a three quark system one must use fractional charges to make the neutron neutral. The debris found in collisions would indicate an apparent extra "quark'. This would be a "sea quark".

If one considers the individual swarms to be equivalent to one of our "quarks", a SD universal neutron consists of four "quarks". In this case no 'sea quarks" are needed. Nor are fractional charges needed. However, I will discuss later another way "sea quarks" could be generated.

Let's arbitrarily make conditions such that it is intruder_L swarms that are the species less likely to participate in larger structures (Fig 26d). One could even describe them as capricious. If an intruder_L swarm is a component of a quartet structure that is connected to a trio structure, it is in a very different situation from that when it is unincorporated.

While it is participating in one of two connected structures there is a region of greater possibilities between the two structures. These greater possibilities allow the intruder_L swarm to follow one or both of two paths or resonate between the two larger structures. What is more the swarm's ability to have multiple the 3D interface presentations facilitates this. It can be bound to two separate torque patterns. The single 5D column is touching the 3D interface in several places (see Fig 27 below)

There is another possibility. The intruder_L swarms tend to form pairs. This is with each other and with swarms on the other sides of the interface. The only restrictions seem to be:

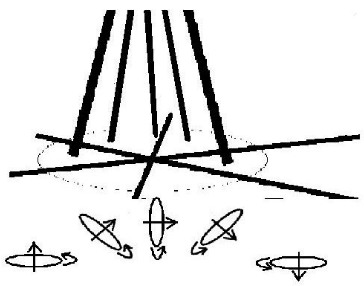
1. That their 3D axis orientations (up and down) must be compatible and

2. They cannot remain paired with an anti structure within the same fluid without undergoing

annihilation.

It’s conceivable that an intruderL swarm could momentarily pair with an upper interface dominant trio and not share the total torque pattern.

Another possibility is that they may form hybrid structures. These structures may have qualities of both situations.



A 5D column at 3 and 4D interfaces, shifts changing its 3D spin.

Fig 27

Recall these things are not little balls. They are the 3D interface presentations at the ends of the 5D interface columns or strings. The diagram (Fig 27) suggests what might happen as a column shifts from one side of a plane within the 3D interface to the other. The swarm column is traveling along the connecting the 4D interface. The 3D interface presentation of the spin at its base appears to reverse magically when all that really happened is the 4D column shifted slightly. The totality of the 3D interface is perpendicular to these columns. This suggests that a minor shift could place them on the other side of a plane, where their spin would be reversed. It also suggests that with very little effort a swarm might not only flip but could flip back and forth continuously. A 5D interface column could take on any the 3D interface orientation through minor shifts. This idea is an extension that is consistent with the "Berry phase" as described in a recent ScienceDaily article (National Institute of Standards and Technology (NIST). "Magnetic switch turns strange quantum property on and off." ScienceDaily. ScienceDaily, 25 May 2017. <www.sciencedaily.com/releases/2017/05/170525141541.htm>.

In other words I find it easiest to visualize these columns as 5D interface pendulums in contact with 4D interfaces coerced into figure eight or more complex swinging loops over the 3D interface. One lobe of a path could be tethered to the primary torque pattern of the swarm conglomerate. The other would be anywhere on the periphery with an orbital spin of opposite 3D presentation. It will be suggested below that these the 4D interface pendulums could follow truncated looped patterns between adjacent swarm conglomerates and that these patterns would be chaotic with attractive regions. Furthermore these swinging 4D interface pendulums, when they are tethered by situations other than close associations with swarm conglomerate or even untethered, could still exhibit this chaotic looped pattern. These pendulums are the 4D interface constructs that are associated with shallow the 3D interface indentations (see SDU gravity below) and as such will many times swing in patterns in which none of the lobes have their core companions in the center. In this situation their 3D interface presentations could even occupy regions on two or more sides of their nuclear cores.

Furthermore the bases of these rotating columns and clouds could fragment at the 3D interface in ways similar to the patterns that tornados form with their ancillary vortices. When this is the case, they are in superposition. *They have a number of 3D interface presentations at the same time and will not establish a permanent state until they encounter a torque pattern that forces them to do so.*

If the reader is to understand the above scenario he needs to try to view both sides of all planes and both directions of all axes that are part of the 3D interface as perpendicular to the direction of the intruder expansion and these columns.

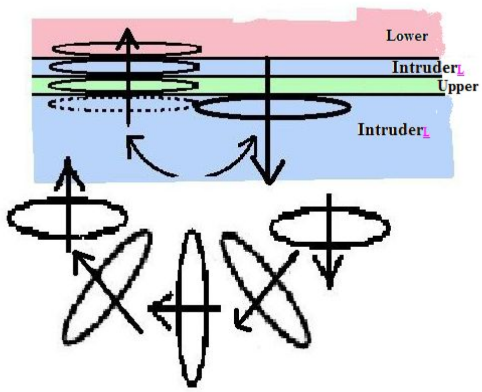
This more detailed picture suggests a number of interesting phenomena.

A device could divide a stream of intruder$_L$ swarm pairs into two streams, each with opposite spins. If these two streams are removed from the device's influence and reexamined later they could be found to have reestablished as of pairs of swarms each of which has a spin opposite the other.

Hybrid forms in which swarms change spin with their position become allowed.

Most of the time one could not determine the spin or position of a swarm until it reaches some ground state. These oscillations between a swarm's potential ground states and its fluctuating cloud of polarized shear will become the basis for superposition below.

Swarms could spin in opposite directions and still present the same patterns of torque around the 3D interface.



Intruder$_L$ flips between two spin states in a static quartet.

Fig 28

All swarms, whether bound by common torque or free on just one side of the 3D interface, would express these properties which allow complex rotation and other motions at the 3D interface that would be impossible otherwise.

So I suggest that there is also a possibility of intruder$_L$ swarms shifting back and forth between a full torque state and a state similar to the pair bond state (Fig 28) with what would have been a Trio$_U$ but is now a Quartet. This would be the case if the Quartet was not paired with another Trio$_U$**.** That is, it is sitting alone or traveling alone across the 3D interface. If it were static, the structure probably could not be maintained for very long because the intruder$_L$ swarm switching back and forth could be very sensitive to interference. However, if it was in motion, this motion across the interface would create additional intensification of torque (as mass described below) which would help to shore up the structure. This additional velocity would facilitate the full torque state of the intruder$_L$ swarm. (In the diagram arrows within the circles indicate spin.)

Splash!

When two conglomerates are forced together with sufficient force to disrupt and fragment their structures, the types and numbers of fragments created should reflect properties of the disrupted swarms and the 5D hyper volumes they occupy. This would also include properties of the particular connecting 4D interfaces they originally occupied. That is the lower interface swarms of the conglomerate would generate more lower interface swarms, some of which could be paired with intruder or upper interface swarms. The same may hold true for disrupted portions of upper interface and intruder swarms. In other words the tripartite nature of the SDU will be reflected by the types of fragments produce in the collisions. The high torque (SDU mass) at the 3D interface in high energy collisions would also have a chance of creating swarms within what were unoccupied interface partitions. For instance some of the energy from the collision of high velocity SDU protons would create swarms within the intruder$_L$ partition (discussion below). These would show up in the debris but there would be not as many as is seen in the SDU proton as in the neutron collisions. These debris fields should be similar to those generated by the “sea” and “strange” quarks in the “Standard Model” of our universe

The SDU would have partitions rather than quarks. SDU baryons would have swarms within all three partitions (three quarks). SDU mesons would have two swarms, one each on two sides of the 3D interface (one quark and one antiquark). SDU lepton swarms would occupy only one partition and would not be perceived as quarks. We could call the swarms within the interface$_U$ “up” (or “heavier” in higher energy configurations because of greater mass that is numbers of shear vortices) with interface$_U$ charge as defined above and the swarms within Lower “down” (or lighter in higher energy configurations because of less mass) with interface$_L$ charge. The intruder$_L$ partition could be classed as “strange” with the capabilities of producing combinations of daughter products in which some have only interface$_L$ charge, others only intruder$_U$ charge and yet others some of each. The debris from a conglomerate containing only one intruder swarm might suggest a SD universal strange number +1 while debris from a conglomerate containing only the other intruder swarm could suggest a SDU strange number of -1. Or the debris from a large conglomerate with both sectors of the intruder filled would have daughter products whose charges canceled each other but suggested a SDU strange number of 2. Thus within the SDU “strange numbers" reflect the numbers and types of swarms present within the Intruder partition. If there is one of each (that is an intruder$_L$ and an intruder$_U$ swarm) within the intruder partition the strange number is 2 with a SD universal charge of 0. All SDU charges cancel out. In this case there could be SDU neutrons and SDU anti neutrons that differ only in the relative positions of the intruder swarms within the “strange” partition, suggesting that because of its position one intruder swarm could be more accessible to the outside world (see “Some imagined structures” above). If a SDU neutron with an accessible intruder$_L$ swarm contacts a SDU anti neutron with an accessible intruder$_U$ swarm they would likely annihilate each other.

The math for SDU universe would be somewhat different from the math for our universe in that there would be no fractional charges but the total charge for SDU nucleons or conglomerates would still be whole integers or zero.

The “strange” property above could also apply to any partition(s) that might contain multiple swarms due to unusual (very high energy?) circumstances. But multiple swarms within the lower 5D fluid could only have interface$_L$ charge and swarms within upper 5D fluid could only have interface$_U$ charge. In these situations the swarms might have the side by side configuration and be “up” or “down” relative to each other similar to intruder pairs described above.

Swarms unpaired across the 4D interfaces within the lower or upper partitions could only remain in contact with the 3D interface if they have very high torque (energy/mass) and then not for very long because they would eventually be swept away by the backflow. However their torque would remain behind because it would be recaptured immediately by the shear which would reallocate it as SDU photonic structures, paired swarms or tripartite structures. The only solo swarms allowed permanence would be those within the intruder which are kept against the 3D interface by the intruder's advance.

These ideas regarding the three partitions of the SDU universe, parallel the concepts of quarks in our universe in as much quarks can exist only in pairs or triplets, until one considers the intruder$_L$ swarms (SDU electrons) and intruder$_U$ swarms (SDU positrons) (arbitrary designations). Because they occupy only one partition, they could be viewed unpaired quarks or leptons in our universe.

This also suggests the possibility that solo swarms within any partition would also have characteristics of leptons in our universe. However they could exist only at very high energies/mass (torque) for short period of time before they swept away by the back flow of the upper or lower fluids leaving their torque behind. This torque would immediately be recaptured by background shear to form other structures.

Some interactions could form debris conglomerates that are so large that they could not be supported by available shear. These will be short lived and undergo decay. Some fragments could remain intact and still reflect all sides of the 3D interface but other decay fragments could follow some patterns similar to these:

Those that occupy:

One or both sides of the intruder$_L$ and lower interface, the lower interface portion of these fragments would tend to be swept away by the lower interface flow leaving behind a very energetic intruder$_L$ swarms and excess SDU photonic energy generated by fragmentation of the original torque. Torque always remains behind through capture by shear.

One or both sides of the intruder$_U$ and upper interface, upper interface portion of these fragments would tend to be swept away by the upper interface flow leaving behind a very energetic intruder$_U$ swarms and excess SDU photonic energy

One or both sides of the intruder$_L$ and intruder$_U$ interface (entirely within the intruder fluid) these fragments when paired would annihilate each other leaving behind high energy SDU photons.

Both sides of the upper and lower interface horizontal, these fragments would be stable but undetectable. They could only exist if they had higher than normal torque anchoring them to the 3D interface, otherwise they too would be fragmented and swept away. This additional torque couldd give them higher velocity and higher mass for their size (two quarks). These upper and lower interface duets could actually be a major portion of matter in the SD universe.

This list is not comprehensive. I'm sure there are many possibilities that I haven't considered. New configurations that are still too large to be supported by available shear would continue the decay process. They would release photons and smaller configurations.

If the smaller configurations are still too large, they in turn will release photons and even smaller configurations. This process would continue until all daughter products could be supported by the available shear permanently or at least have reasonable stability for some indefinite time.

Many of the new swarms could take on configurations similar to those shown in the section entitled "Some imagined structures". They also could take on many configurations not shown.

In the SD universe mass is produced by the interaction of torque and background shear. In our universe it is produced by the Higgs boson. Still, it would be likely that within the SD universe, conglomerate collisions of sufficient energy could produce "particle zoos" and swarm conglomerates with decay patterns similar to those expected even from the Higgs boson but these fragments would not be the cause of SDU universal mass only an expressions of its energy reallocation.

When the energy (mass/torque/indentation shape/velocity) is optimal, collisions could produce some conglomerates with swarm numbers that would not ordinarily be supported by available shear. (I used / marks instead of commas to remind the reader that within the SD universe all these properties are expressions of a single energetic value.) These conglomerates would have extremely short half lives.

In addition there should be conglomerate patterns associated with specific energy ranges. There likely could be sequential energy levels that produce specific fragmental patterns. The internal resonances within the swarms and their SDU quantum states at impact would determine the probability of the patterns created. These created patterns could vary with stepwise equipment energy levels and be observed as resonances.

One possibility is that of a decrease in the diameter of a swarm's eye in the direction of motion, where it contacts the 3D interface, in response to shorter wave lengths of internal resonant photonic structures. This wave length would shorten in response to increased energy as suggested in "Intro to SDU photonic patterns", below. This would create increasing instability on the main column along the 4D interface which has a diameter that is imposed by 5D forces. The swarm's eye wall 3D diameter would continue to flatten with increasing energy until the resonant photons were small enough to fit multiple cycles into what is a compatible 3D eye wall diameter. At this point the swarm would expand to its original diameter but with the new photonic pattern having higher energy and frequency and shorter wave length. It is actually a new energy configuration and it would be seen to produce a different debris pattern in collisions at this new energy. This new energy configuration might be the basis of resonances at different energy level similar to those seen in our experiments.

Introduction to SDU inertial and gravitational mass.

SDU inertial mass

The effects of moving onto fresh 3 and 4D sheared interfaces are important because when they are combined with other factors, they could be responsible for a number of phenomena. Among them the increased SDU inertial mass when systems are in motion and ultimately the loss of SDU mass when unconnected swarms connect (see "the limitations imposed by available shear" below).

If swarms were not moving, their 3D torque patterns would be uniform all around the eye. But when they are placed in motion for what ever reason, the vortex numbers in that segment of the circular swarm which are in the direction of overall motion will be concentrating shear vortices which intern will create a region of greater torque. There will also be more of them because as they shift onto newly sheared interface, there is greater opportunity for additional vortices to accommodate and maintain this additional torque. It would be like running in the rain.

This is somewhat like a hurricane moving over the warm waters of the Gulf of Mexico. This warm water provides warm moist air to fuel the hurricane. It mixes cool deeper water with warm surface water as it moves so the surface behind it is always cooler than the surface in front of it. This encourages its forward motion. It follows available energy.

One could also describe the swarms in a similar manner in that the increased numbers and intensity of thunderstorm cells generated as the hurricane moves onto new warm water is analogous to the increased concentrations of vortices associated with the swarms as they move onto newly sheared interfaces. The energy as shear on the forward side of a swarm would be greater than the energy on the back side because there, the shear energy has been used up (for the moment) and the interface is in the process of building up new shear. I will be calling the increased torque on the forward side of the swarms “Intensified torque The intensified region of hurricane are measured as wind speed but the amplitude of swarm intensity is measured as “torque” at the 3D interface. This torque could be also applied to one or both of the connecting 4D interfaces around the 3D interface. The presence of the swarm would alter the contours of the 3D interface such that it would become blunted and more perpendicular to the Lower/Upper horizontal interface. This would allow greater numbers of 3D shear vortices and greater torque at the swarm’s interface.

Another factor that needs to be considered here is the way vortices concentrate into centers of greatest torque as suggested in section "Close up view of the background, Figures 16 a through d". One would be tempted to consider the “eye wall” as the center of greatest torque but when we

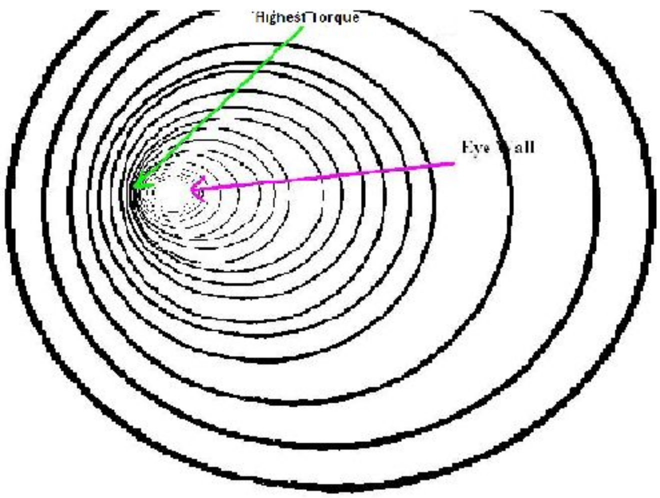


Fig 29a

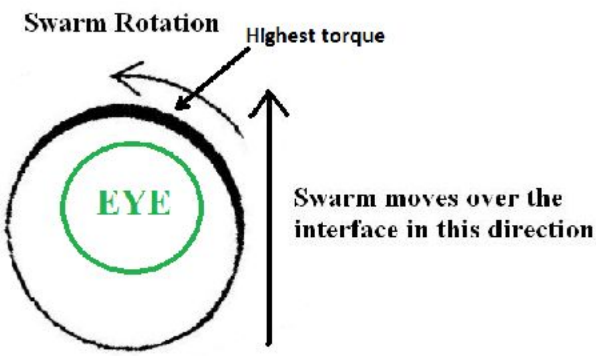


Fig 29b

consider that there is no torque inside the eye wall then we must consider that there is greater torque outside the eye wall. If this is the case eye wall vortices will attempt to shift into this region dragging the swarm center with them (Fig 29a) So the picture now is of a rotating outside swarm field shifting towards a center of maximum torque just outside the eye wall and a rotating interior swarm field moving towards that same center of torque dragging the swarm center with it.

Figure 29b illustrates how intensified torque might look. It is the 3D presentation of an unpaired solo Intruder swarm. The intensified torque approximates the three quarter position of the eye wall because here, vortices are accelerating and gaining energy as they move into this region. At the halfway mark they are decelerating and losing energy as they are pulled away from the region of greatest torque. The reader should also remember that the swarm rotations here (and in all of the other diagrams) are 2D representations of rotating 5D columns, that extend up their adjacent 4D interfaces and that many of the effects attributed to SDU inertial mass are influenced by the imbalance of the swarm structures in the columns above the 3D interface.

There would be two variations of this particular swarm species. They would occupy only the Intruders 5D space. One of their cylinders of escaping vortices would go along the Intruder/Upper 4D interface. The other would go along Intruder/Lower 4D interface. It has been suggested that those swarms associated with only one side of a 4D interface would have more options for their 3D presentations.

A major condition that has no analogy is that multiple swarm configurations could be like compound hurricanes. These would be duets, trios and quartets, that are moving over and sharing the same 3D interfacial torque but in different positions around that interface. This allows the two or more cylinders to rotate in opposite directions without clashing with one another. They don't actually touch. They just follow the circular common torque around the 3D interface between them.

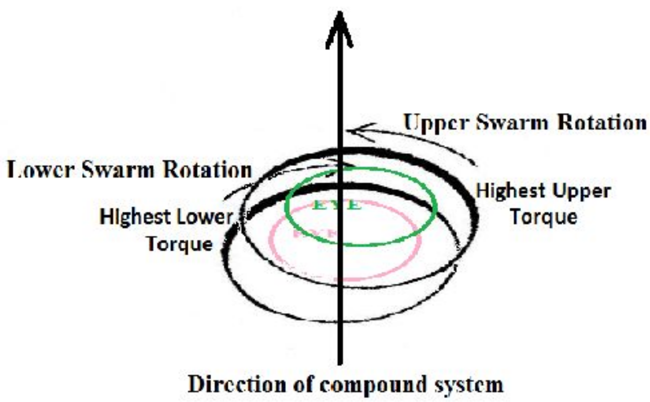
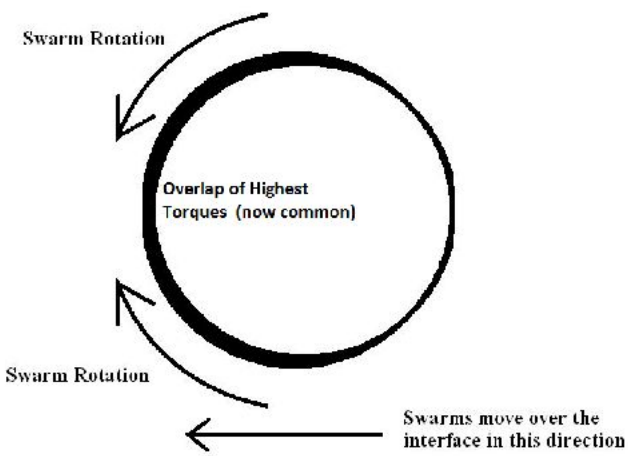
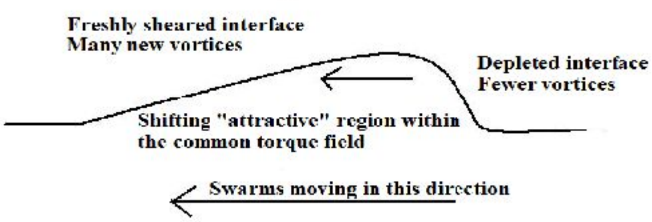


Fig 30



Lower and upper swarms with common torque at the 3D interface.

Fig 31



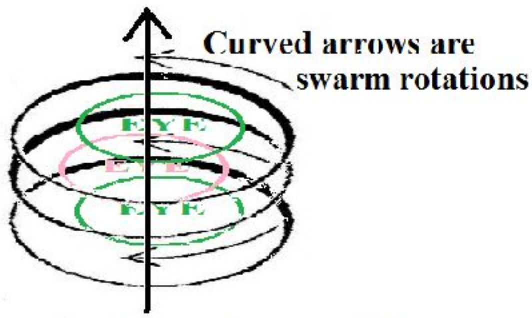
Upper and lower swarms with common torque, side view

Fig 32

Figure 30 suggests an exploded view of paired Lower and Upper swarms on two sides of the 3D interface sharing the same torque. This particular structure would be invisible in the SD universe but it will be suggested that it is a major form of SDU matter below.

Figure 31 is rotated 90°. It suggests how the common torque could intensified on the entire forward half of the structure in contrast with the intensified torque leaning to the right or left of the Intruder swarms above. The shared intensified torque in this case is symmetrical. Torque's direction in the different segments varies as we move around the swarms. Torque on the foreword side is most intense. The rotation of the swarm on the Upper side (top) is opposite that of swarm rotation on the Lower side (bottom). However they have the same 3D presentation although their vortices have opposite rotation and are circling in opposite directions (above and below the 3D interface). The Lower and Upper torques are of equal intensity. It will be suggested later that configurations that have equal intensities of their Lower and Upper torques will not influence or be influenced by any of the unbalanced configurations or their wakes.

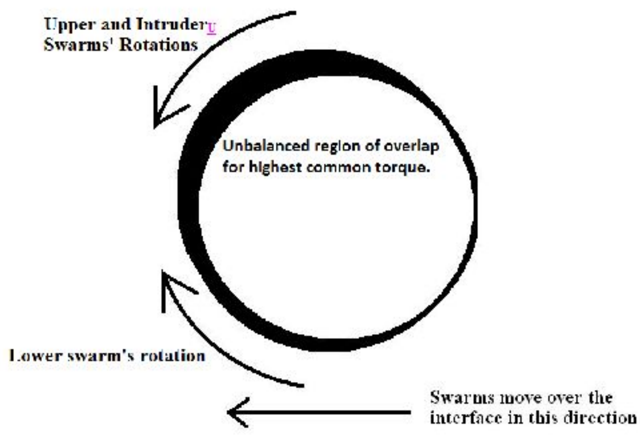
Shear intensity should be less on the trailing side of any high torque wave that passes over a sheared interface. The shear intensity recovers quickly but it should still take a small amount of time to recover and there should be a difference in intensity between the leading and trailing regions of a moving wave. Figure 32 is a graph suggesting that vortex formation would be more likely on the leading sheared interface than on the "depleted" interface. This imbalance would tend to continuously shift the "attractive" region or position of highest torque forward. The vortices created will be aligned with and contribute to the overall torque pattern. Some of these new vortices are close enough to join the central swarm just outside of “the eye wall” others contribute to the field of polarized shear around the swarms. If this structure is accelerated, the torque on the forward side will increase and the attractive region’s rate of shift would also adjust to compensate for the new velocity. Once the torque has increased, this new rate of shift will be maintained by motion over newly sheared interface where there are more vortices available to maintain it.



Direction of unbalanced swarm Trio

Fig 33a

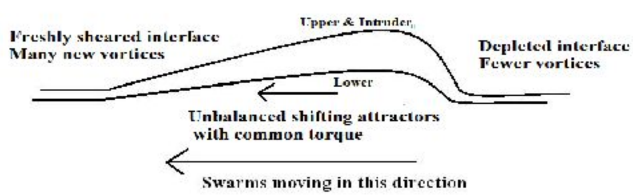
Figure 33a suggests an exploded view of connected Lower and Upper swarms with an Intruder (either $_{U}$ or $_{L}$) swarm on three sides of the 3D interface sharing the same torque. This particular structure would visible in the SD universe and would interact with other unbalanced swarms including the single Intruder swarms above.



A swarm trio showing unbalanced common torque at the 3D interface

Fig 33b

The Figure 33b is rotated 90°. It suggests the lopsided torque pattern that might develop when the additional Intruder$_U$ (or Intruder$_L$) swarm is present. This torque pattern is not only unsymmetrical, it also has a predominant upper (or lower) torque because the torque on one side is twice that of the other. The swarm with the odd torque should still contribute to the common torque pattern but it extends it around the ring such that this swarm conglomerate has two 3D presentations that are opposite each other. The weaker presentation would cancel out the torque of one of the other two swarms and the overall effect would that of the torque from the remaining swarm. This structure will be shown to be sensitive to the wakes of other unbalanced swarms and that its wake can also influence these other swarms. However the two presentations will have additional effects to be described in



Unbalanced swarm trio with common torque, sideways view

Fig 34

the section entitled “Intro to SDU quantum effects”

Figure 34 is similar to Figure 32 except it suggests an imbalance of intensified torque and torque rotation. The concept of a shifting attractive region is complicated by the new irregularities. These complexities will be discussed below when I speculate about the wakes and fields that accompany these objects but for now I want to emphasize the shifting attractive region and its consequences. This shifting of the attractive region with its feedback could become the Shear Dependent Universe's inertial mass.

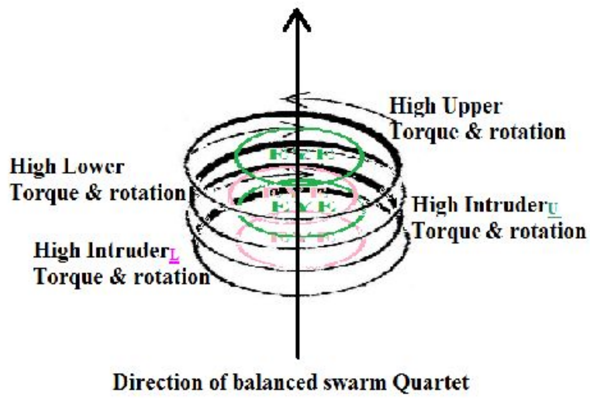


Fig 35

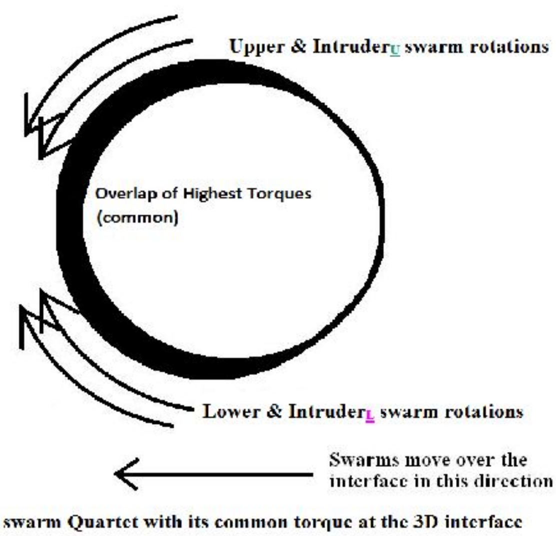


Fig 36

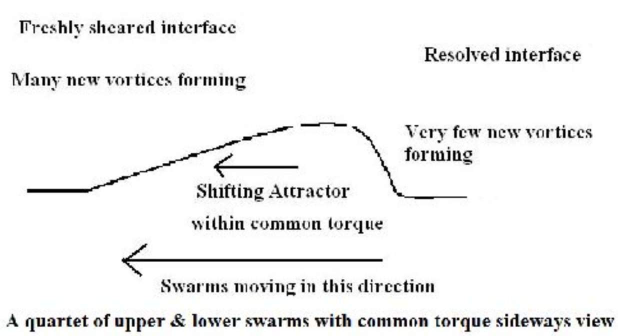


Fig 37

The fourth swarm configuration I am focusing on is that of a quartet. (Fig 35)There are many others and some of them were discussed in the section above entitled "Splash" This configuration has swarms with common torque on four sides of the 3D interface. It also has equal numbers of Lower and Upper swarms.

The Figure 36 (rotated 90°) suggests a pattern similar to the Lower/Upper duet above with balanced torque. This structure would not influence nor be influenced by imbalanced structures

The mass of a quartet (SDU neutron) would not be one third more than the mass of a trio (SDU proton) because total available shear could not supply sufficient vortices for the intensified torque.

Available shear is determined by the speed of expansion, which is the intruder's motion against the other fluids. If we set the intensified torque of a trio to be very close to but not maximized to what is allowed by available shear the addition of an Intruder$_L$ swarm cylinder could not happen or would require that available torque be redistributed among all of the swarms. I am suggesting that quartets usually follow the second path and some intensified torque is converted to other structures as swarm portions leave the main conglomerate. This could result in small decreases of the total SDU mass. This effect would be present regardless of whether quartets were static or in motion. When static, their maximum use of available shear would cause them to decay if for some reason they slipped over the rate of shear produced by the 3D interface. Therefore half-lives of static quartets would be short. However the motion of quartets over new interface would increase the availability of shear and increase intensified torque uniformly and in this case they would be more stable. (ref: **Secret of a Lifetime** **"**How long a neutron lives holds clues to the cosmos", Rebecca Cheung' Science News May 19th, 2012; Vol.181 #10 pp. 20) This is covered in more detail in the section entitled "The limitations imposed by available shear".

Figure 37 is similar to that of the Lower/Upper duet. Its comments for now are the same.

The combined motion of these structures along 3D interface is constantly maintained by the accumulation of higher numbers of vortices that are encountered by this motion. These vortices then travel within their columns up and down the adjacent 4D interfaces.

In other words if these swarms were not moving there would be no intensified torque. The steady production of shear in static volumes is limited to the effects of local background shear. But if the systems don't wait for new instability but move onto freshly sheared volumes they would have access to more vortices. Their intensified torques are sustained by this movement onto fresh interface. Once a system acquires the energy for motion, that energy is maintained until it is absorbed and the system decelerates or it is enhanced and the system accelerates.

The feedback loop is always reestablished whenever energy is added to these systems. The swarm moves onto fresh interface which maintains this intensification which then shifts the swarm onto fresh interface which maintains the intensification and so on. A more rapid motion maintains higher intensification with higher torque. A slower motion maintains less intensification with lower torque.

Another way of looking at this is:

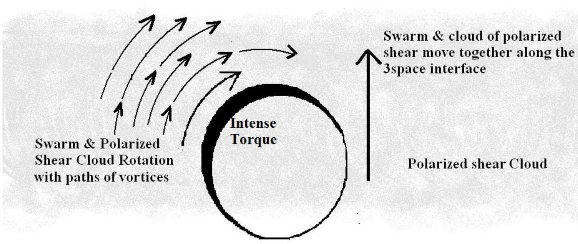
The attracter within the intensification is where the torque is greatest. It is the accumulation of the torque contributed by all the vortices present including those further out.

Vortices are more likely to be formed and maintained at 3D interface where the shear is greater which is out side the swarm. Therefore there is always an imbalance of vortex production and the attractive region will always be moving onto fresh interface. When the swarms are not moving across the 3D interface they are still rotating within their orbital / indentation (virtual well, see below) and still constantly moving onto locally fresh shear. The attractive region here is rotating but the system as a whole could acquire sufficient energy to cause it to start shifting. This could happen if another concentration of torque was created just outside the orbital causing the whole system to shift in that direction. That new imbalance would be retained and the system would continue in that direction until it was interfered with.

In spite of these alterations of orbital patterns, the speed of the swarms along the 3D interface should remain constant. Whatever distance and time that becomes devoted to travel in straight lines along the 3D interface should be removed from the distance and time spent following their orbitals. It will be suggested below that the rotation within their orbital creates overall swarm fluctuation that can influence nearby swarms and vice versa. This further suggests that swarms that move together would have resonant orbital frequencies. That is, their frequencies could be the same or multiples of each other.

The point of the above discussion and diagrams is to suggest that one aspect of SDU inertial mass is that of the shifting attractive region being maintained by its motion onto fresh shear. This feedback mechanism is one foundation of SDU inertial mass. Other factors contributing to SDU inertial mass will include the interaction of Trious and Quartet swarms within a common gravitational indentation (see below).

Another important component of these structures is the nature of their swarm/clouds of polarized shear. These clouds are not truly separate from the concentrated shear around the “eye” but at times I need to refer to them as though they are separate. This shifting polarized shear will have all the qualities of the vortices within the swarm’s eye. They will follow the same shifting attractive regions as the eye. If there are changes within eye, there will be changes within the clouds. If there are changes within the clouds, there will be changes within the eye. Therefore these clouds contribute substantially to SDU mass because the motion of each vortex within the cloud influences the motion of the vortices around it including those where the “eyes” of the concentrated cylindrical swarms contact the 3D interface.



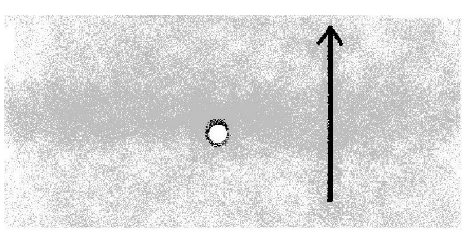
Swarm with its cloud of polarized shear

Fig 38

The expanded concept is that of slow moving waves dragging the eye swarms Within the SDU universe these clouds and eyes are two aspects of same thing.

Both contribute to its SDU inertial mass.

The simplistic diagrams (Figures 38 and 39) show only left and right aspects of a cloud at the 3D interface but this cloud also extends into the hyper volumes, up and down, forward and behind. In addition the diagram above is supposed to suggest that the vortices within these clouds take on the all motion and shapes exhibited within the central swarm(s) and all the aspects of its (their) orbital spin(s) as described below. The arrows around the eye suggest the paths that the individual shear vortices would follow in response to a



Swarm cloud with neutral torque

Fig 39

predominant torque. This is allowed by the nature of their 5D vortices. The reader is looking at a cross section of the "eye" of the cylinder's contact with the 3D interface and its associated polarized shear. The second diagram (Fig 39) has "neutral" predominant torque and polarized shear. This happens when Lower and Upper interfaces are involved equally. See the "Quartet" diagrams above and "SDU atoms" below

Polarized shear anchors the rotating cylinders to the 3D interface by constantly reestablishing the contact with new shear vortices. It will be suggested below that spin associated with swarm eye's orbitals will cause the swarm/clouds to fluctuate allowing for SDU quantum effects.

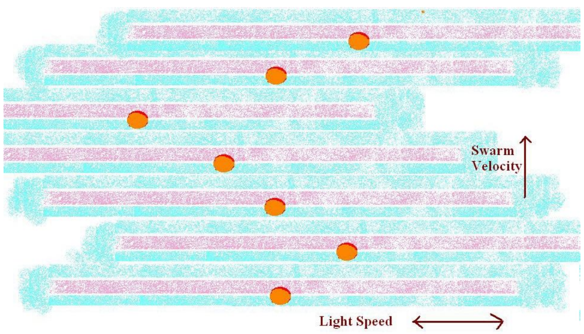


Fig 40

Figure 40 suggests some aspects of a polarized shear cloud as it move with an eye. The width and depth of the swarm taper off and would be considerably larger than in the diagram but the abbreviated version allows the reader to see that the swarm intensity would be seen to oscillate. The eyes orbital motion (see below) would add these fluctuations to the swarm. But the eye is still kept immersed within the shifting swarm.

These clouds are extensions of the eyes. One could not differentiate any point at which swarms end and eyes begins. In fact the only region where there would an abrupt change of vortex density would be at the eyes or inner walls of the cylinders. These would be the points at the 3D interface that could be compared to our particles.

All the aspects of swarm intensified torque are contained within the polarized swarm clouds. The connectedness between newly created and older shear vortices by way of this torque should allow swarm portions to persist under certain conditions (see Intro to Quantum effects below) for short periods even after they are separated from the main cylinder. These separated portions would have the same forward velocity as that of the swarm before the separation. They would dissipate eventually but would keep the initial forward velocity until dissipation is complete.

The diagram above is a cross section of a cloud-swarm combination at high velocity. Polarized shear clouds should vary in shape according to their velocity, from spherical when there is no motion, to increasingly oblate spheres upon acceleration, to pancakes and then to planes at very high velocity. They would also be tilted as a consequence of the movement at the 3D interface drags the 5D columns (or strings) behind them.

Swarm conglomerates should have powerful emergent polarized shear clouds that reflect and control the whole. Those clouds that have equal Lower and Upper vortex numbers and torque would not interact with swarms that have an imbalance (SDU charge).

These clouds should also contribute to conglomerate swarm's greater inertial masses. However the inertial mass of conglomerates would not simply be a multiple of the masses of their individual swarms for reason explained below under "The limits of available shear". Things have to be more complicated than that.

SDU gravitation and virtual wells

The partner of SDU inertial mass is SDU gravitational mass. This is in the form of gravitational indentations.

I picture Intruder, Lower and Upper as very thin layers on this ancient hyper sphere. There could be regions with thick layers but I'm setting this to be a region of layers that are thin in one direction perpendicular to Intruder's expansion. Think in terms of a very thin expanding 5D pancake. The 4D interface between these layers stretches back from the front of advancing 3D interface. This suggests that the tails of any vortices produced by the shear of Intruder against Lower and Upper will also be pulled back from the advancing 3D interface. This backward pull or drag would impede the Intruder's advance wherever the vortices are present but especially when they are highly concentrated.

In most regions of 3D interface, the chaotic and random activity of these vortices would not affect the overall contours of the interface. In these regions the apparent backward flow of Lower and Upper which is perpendicular to the 3D interface is uniform.

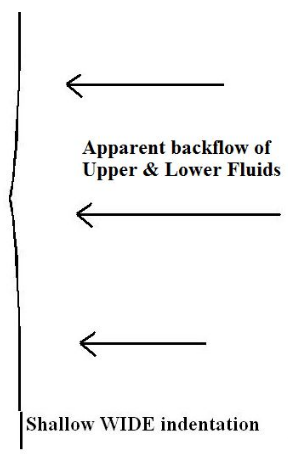


Fig 41

However regions with high densities of organized vortices should experience excessive drag and be indented (Fig 41). The 3D interface contour here should take on vectors progressively more parallel to the direction of Intruder's advance. In these regions, the apparent backward flow of Lower and Upper is no longer totally perpendicular to 3D interface therefore vortex conglomerations and background vortices will tend to be swept back and towards the centers of indentations. The speed of Intruder intrusion between Lower and Upper would allow extremely minor indentations to have excessive effects on swarm accumulation. I call these structures "virtual wells". These virtual wells could generate strong SDU gravitational fields.

All of the diagrams of virtual wells within this document have highly exaggerated indentations so that the reader can visualize their directions..

These indentations could also stretch the 3 and 4D interfaces a little bit so that there are slightly greater volumes and hypervolumes subject to shear. This allows for greater numbers of background vortices which might also contribute to increased drag on the advancing interfaces.

So the total drag would include that which is produced by the high concentrations of vortices within the swarms, an additional fraction produced by the extension of the interfaces around them, a fraction produced by polarized shear and a fraction contributed by neutral Lower/Upper duets. These

Lower/Upper pairs could exist without any Intruder swarms associated with them (see Some Imagined Structures above). These pairs would contribute to and shift into virtual wells but would have no other interactions. These additional fractions might increase as the interface becomes more indented.

So, SDU gravity is created by the combined effects of the 3D interface contours and the back flow of Lower and Upper fluids. Everything caught within this flow would have the same rate of acceleration regardless of its SDU inertial mass.

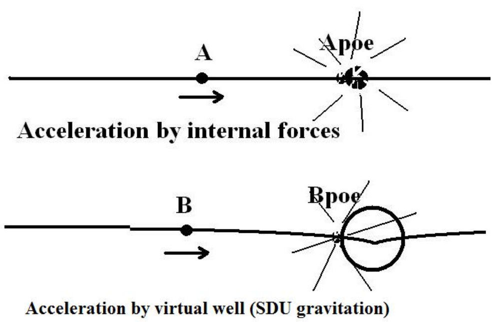


Fig 42

This SDU gravitational flow could be artificially simulated by accelerating systems along the 3D interface (Fig 42). They would respond to the acceleration by changing their intensified torque but once a final velocity was established, the new intensification would maintain that velocity and no longer simulate the SDU gravitational flow gradients until additional force was applied (SDU inertial mass).

When a system of swarms is pulled into a virtual well it is swept into the stream, and although it is in free fall, its intensified torque increases because it is still accelerating along newly sheared 3D interface. It is also progressively more parallel to the Lower/Upper fluid backflow so its speed increases. The system continues to receive additional energy as its velocity increases. When it has traveled as far into the indentation as it can (for instance it runs into the SDU mass creating the greater SDU gravitational field) it stops and it must release all of that acquired energy because available background shear can no longer maintain the intensified torque acquired by its motion. This is the same effect as that of an accelerating object impacting another object in its path. These points of impact are labeled “Apoc” and “Bpoc” in Figure 42.

If it has acquired enough energy (as intensified torque) and its direction is such that it misses the object responsible for the greater SDU gravitational field, its direction will be changed by the apparent new directions of Lower/Upper flow and it will either orbit within or escape the objects gravitational field. It makes no difference to the swarm group as to whether it has velocity along the 3D interface or it is held in place while Lower and Upper streams flow through it. It is still being exposed to freshly sheared interface which maintains its intensified torque (SDU inertial mass).

A single swarm or group that is static (not moving along the 3D interface) will be constantly shifting as it sits at the bottom of its own virtual well, moving its intensified torque to face new directions of the Lower and Upper inflow. This shifting for any swarm or swarm group would be a constant curved motion caused by the higher torque on one side of these structures.

In other words all single swarms would have one sided intensified torque compatible with the Lower or Upper inflow only on one of their sides. This imbalance would make them rotate within their virtual wells. This rotation could be in any plane on the 3D interface because all directions are here are perpendicular to the adjacent 4D interfaces and as they rotate there is no change in their intensified torque. Therefore there is no loss or gain or gain of energy. although there are fluctuations within the swarm cloud. This allows for swarms to have "down' rotations when compared to others having "up" rotations at the 3D interface regardless as to whether they both escape up the same 4D interface or at opposite interfaces.

So the expanded picture of swarms is that they have at least two forms of rotation. One I will call "SDU intrinsic" and the other will simply be orbital.

The "SDU intrinsic" will be the general rotation of polarized shear around the eye of the swarm. No single vortex travels very far in this rotation before it escapes up the cylinder. No single object ever transverses the total swarm circumference. It is because of this that the intensified torque maintains a single position within the total swarm.

Orbital rotations are the many paths (some of which are circular, some of which are irregular or indefinite) that the base's of the cylindrical swarms can follow as they interacts with the 3D interfacial environment. These orbital paths create fluctuating fields of polarized shear and torque around swarms. These fluctuating fields are capable of forming resonances with other fluctuating fields. Orbital rotational paths are how the rest of the world sees swarms.

Groups consisting of three swarms about a single torque pattern I have called "Trios". These have intensified torque compatible with fluid motion on both sides of their rings but the greater torque (intensified) on the one side would still cause the swarms to rotate. The speed and frequency of these rotations would be influenced by the internal resonance suggested above. I have called the four swarm groups, "Quartets". They would also rotate similarly because within the system, the placement of the intensified torque around their rings would be slightly irregular because of the capricious extra Intruder swarm. These more mobile swarms could be either Intruder_L or Intruder_U. This mobility associated with Intruder swarms suggests some differences in intensification quality close in because of its constantly shifting positions but outside the system, this irregularity might be undetectable. (I will not give Quartets a subscript because they would appear to have no predominant Lower or Upper torque. They will however have a matter or anti matter designation as determined by the position of the secondary Intruder swarm.)

Once a system is put in motion, the strongest torques would tend to align perpendicular with the direction of travel although the unbalance would still cause rotation. That is the swarm groups would not simply travel in the indicated direction but would spiral about an axis tilting in that direction. The shape of the indentation would also change. This is important because these rotating intensified torques determine how these swarms interact with the 3D interface around them. Static swarms have a uniformly intensified torque all around them because, they move in such complex spiral orbitals such that their 3D presentations are those of spheres. As these swarms are put in motion, they start moving in spirals whose axes are somewhat tilted to the direction of motion in such a way that the spheres become slightly flattened in the direction of motion. Torque in the second case becomes more and more perpendicular to the line of motion as their velocity increases. This motion has been described as though it is on a flat interface but swarm SDU gravitational indentations add another layer of complication.

Therefore these indentations should change as a swarm moves within its well. Wherever the highest torque and its associated vortices happen to be at any single instant is where the indentation would tend to be deepest. I say “tend to be” because changes in the 3D contours might have difficulty in keeping up with the rapid spiraling of the swarm. So the indentation of a static swarm would appear to have a constant depth when viewed from any side within 3D interface. If the swarm is put into motion the shape of its spiral will tend to flatten perpendicular to the direction of that motion and its gravitational indentation would appear to do the same with a major difference. It is now slightly deeper on the side that opens in the direction of its velocity and it has lost some depth everywhere else. It would appear elongated to a 5D observer, but flatter when viewed from the side by a 3D observer. The 3D observer could not actually see the depth of the well because he can only observe by way of SDU light, which is a transverse wave along the 3D interface. He could however see objects made up of swarms change shape. That is, if he used a ruler that was not traveling with these objects. Rulers traveling with them are also made up of swarms. Their shapes would change in exactly the same way. They would not be useful in showing the shape change.

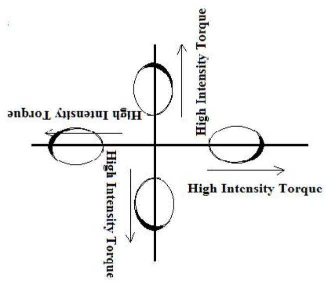
Although each group or single ring system has its own indentation and very weak SDU gravitational flow, the most prominent SDU gravitational flows are caused by accumulations of grouped and single ring systems. These accumulations create regions of intense drag on the advancing 3D interface. Small accumulations create weak SDU gravitational flows and have very irregular shapes. Larger accumulations have spherical 3D presentations because of greater SDU gravitational flow. Massive accumulations induce progressively stronger SDU gravitational flows and may even have sufficient SDU mass to create SDU black holes.

Before continuing, I want to emphasize that these swarms are always influenced by the interplay between the shapes of their virtual wells, the presence or absence of compatible 3D torque and their accompanying polarized shear. Velocity alters the shapes of the virtual wells but so does 3D torque and intensification of torque.

In fact these four phenomena, virtual well shape, spin contour, intensification and velocity are interdependent. If you change one, the others will also change.

These phenomena could be isolated mathematically. One could measure each separately. For instance one could quantify SDU gravitation as SDU gravitational mass or velocity as speed and direction or the intensities of SDU charge relative to distance or SDU magnetic field intensity. But each of these is still only one aspect of a complex interdependency.

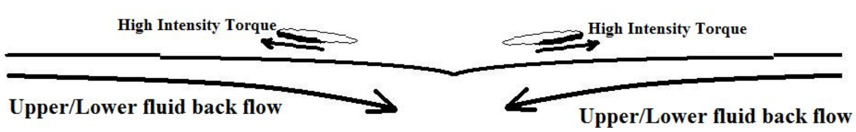
Introduction to SDU charge



The inertial mass of the High Intensity Torque always moves into the Lower/Upper fluid backflow in every position of a swarm's orbital regardless of orbital shape.

Fig 43

Figures 43 and 44 are to remind the reader of some aspects of intensified torque. The torque is always going to move onto fresh interface, and in the case of the virtual wells, that would be against the backflows of the Lower and Upper fluids. The slight indentation created by the swarm will cause that backflow to be from everywhere on the 3D interface towards the center of its virtual well. So the picture now is of swarms rotating rapidly within their virtual wells. This rotation can be in any direction as far as the 3D interface is concerned but the intensified torque and its polarized shear should always be slanted toward the edge of the virtual well because that is where the newly sheared interface comes from.



The inertial mass of the High Intensity Torque always moves into the Lower/Upper fluid backflow in every position of a swarm's orbital regardless of orbital shape

Fig 44

It makes no difference as to whether the swarm is moving or the interface is flowing beneath the swarm. The intensified torque behaves in the same way.

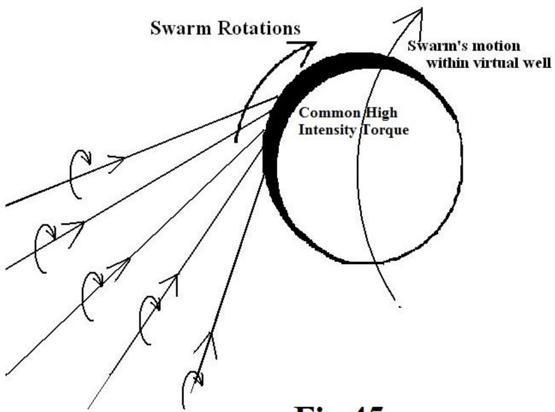


Fig 45

If swarms are not traveling along the 3D interface they should spend equal times everywhere within their indentations. This suggests that the broad presentation of their intensified torque would be that of waves of polarized shear with the same 3D twist radiating everywhere around the indentation. This twist would be the same for all observers from all sides. This twist could appear to be either Lower or Upper, whether it is viewed from the right or left, from the top or bottom, or from the front or back.

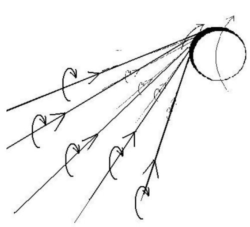


Fig 46

Figures 45 and 46 suggest the motion of the individual Intruder$_L$ polarized shear vortices around the Intruder$_L$ eye as it orbits within its well. The first is a close up view showing that nearby the vortices within the cloud are closely following the rotation of the concentrated polarized shear.

Figure 47 is a composite of the pattern of individual Intruder$_L$ vortices at greater distances from the eye.

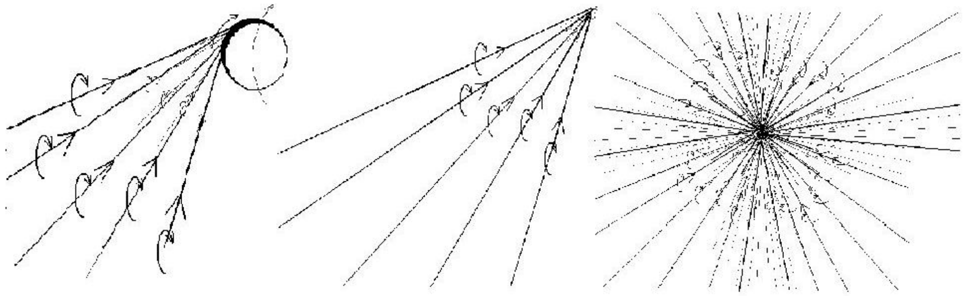


Fig 47

Another way to describe this field of torque is to compare it to an erratically spinning sprinkler with only one nozzle. The sprinkler is spinning but once water has left the nozzle it continues in the direction it had when it exited the nozzle. The analog to the water is the somewhat diffuse beam like wave of concentrated torque coming from the intensified torque at the eye wall within the swarm. When it first polarizes more distant shear, the newly created vortices have a direction of travel parallel to the vortices that were within eye wall. They maintain this direction even as the eye changes its direction with the intensified torque rotation. This means that they must follow the axis of the intensified torque vortices even as the intensified moves away from them. Now they are behind the intensification. They will maintain the most recent orientation and direction as the intensified torque moves to the other side of the well because they only have their own torque and the torque of nearby vortices to guide them. So they shift toward the eye wall even though the beam has moved on. Allow the eye's intensified torque to have sufficient angular velocity to point in all directions within a very short time, constantly reinforcing the polarization of shear before the polarization has time to weaken substantially. In this way there is always a residual pattern of torque around the swarm that is the same when viewed from any direction.

If you should bring another swarm with the same predominant torque near the first, the region between them would undergo interference because this is where the torques produced by these swarms would have opposite 3D presentations. The shear between them becomes less polarized and more chaotic. So the shear clouds become unbalanced and tend to move away from each other taking their eye walls with them. I know I'm repeating my self but one of the earliest concepts was that similar torques coming from opposite directions have opposite 3D presentations.

The swarms rotating within their wells must take on orientations allowed by the totality of their vortices. These vortices will tend to move onto interface with the most compatible torque and shear. This would be onto 3D interface away from the interference and therefore away from the other swarm. Their reoriented intensified torques change their spin contours, well shapes and velocities.

If you should bring swarms together with opposite predominant torque, that is one with Lower torque and one with Upper torque, the field between them would undergo reinforcement and its polarized shear intensified because here the opposite torques from opposite directions have the same 3D presentations. The rotations within their wells will take on orientations which accommodate the vortices within the swarms because of these vortices' tendencies to move onto space with the most compatible torque and shear. This compatible polarized shear would be within the region between them and so they would move towards each other. The intensified torque is accelerated, intensifying the spin contour, deepening well shape and increasing the swarm's velocity.

There is no predominant torque around Quartets or Lower/Upper duets. So they would not reinforce or interfere with any other type of swarm. Velocities would not change unless they bumped into each other but that is another story.

Let's scale up the situation. It will be suggested below that Intruder_L and Trio_U swarms would be building blocks for much larger objects and that these objects could have equal or disparate fields of torque and polarized shear. How would these interact?

If an object made up equal numbers of Intruder_L solo swarms and Trios_U swarms there is no predominant Lower or Upper torque present. The object's field has equal numbers of each orientation of torque waves within it. It is uniformly flat "torque wise" and it doesn't influence any other objects that may have a predominant torque. The shear fields, while still present, are at separate interfaces but in total have equal but opposite 3D presentations and cancel out each other's torque at distances. There could still be compatible reinforced torque within the object

But give this object an excess of, let's say, Intruder$_L$ swarms. The larger gravitational indentation of this object causes all of its swarms to spend substantial time facing the incoming Lower/Upper backflow. That is they are facing away from the object's center of gravity. Its 3D presentation will reflect this. The distribution of those excess Intruder$_L$ swarms will adjust to this by aligning their torque to accommodate the situation, that is, to face the flow in all 3D directions. If they are freely moving they will tend to become distributed evenly on the perimeter as is the case for electrons . They really are all oriented in the same direction but in this case the direction is "out" when viewed at the 3D interface. They have all taken on vectors that are somewhat in the direction Intruder's advance which is perpendicular to the 3D interface. So the larger picture is that they really are all traveling in the same direction, into the back flow

Now the 3D presentation of the object is that of Lower's torque when observed from any angle. All the Intruder$_L$ swarms are facing outward. If another of these Intruder$_L$ predominant objects approaches the first, the region between them becomes filled with Intruder$_L$ torque waves and shear. These waves have opposite 3D presentations because between the objects they have opposing directions of propagation. These torque waves interfere with each other. This region has equal numbers of torsion waves of each 3D presentation but does not provide the torque contour that encourages the Intruder$_L$ vortices to continue in this direction. Those waves of polarized shear, that can, will continue in their original directions, bending around the second object to the other side of each (like a tsunami circumvents an island). Here the 3D presentation of each is compatible because these waves are traveling in the same direction so here the waves reinforce one another. The 3D interface between them contains destructive interference. The regions away from the direction of approach are reinforced. The Intruder_L swarms of each will tend to move towards those areas of the 3D interface that have the greater Intruder_L torque and shear compatible with their own 3D presentation. Thus the closer these objects are to each other the greater the number of freely moving Intruder_L swarms that shift onto the side opposite of that approach. These swarms are no longer simply sitting around the edge of the object's gravitational well. They are flowing into regions with the highest compatible shear and in the process pulling the two objects away from each other. All of their intensifications have been reoriented, changing their spin contours, the shape of the overall gravitational indentation and the overall velocity.

Now imagine an object with an excess of Intruder_U swarms approaching the one with an excess of Intruder_L swarms. The 3D presentation of one object is that of Upper torque when viewed from any angle. The other has Lower torque when viewed from any angle. As the object with predominately Upper torque approaches the object with predominant Lower torque, the region between them becomes filled with compatible torque and intensified polarized shear. The 3D presentation of the shear waves from the approaching Upper object has the same twist as that from the Lower object approaching from the other direction. Now it is the region between them that has the reinforced polarized shear and it is the 3D interface behind them that has the interference. Swarms for each adjust accordingly pulling the objects with them towards each other. The already intense torque field intensifies more and reorients their intensificed regions which changes their spin contours, deepens their gravitation indentations on that side and increases their velocities towards each other.

If we allowed these objects to touch they could arrange themselves into patterns in which each Lower dominant swarm was next to one or more Upper dominant swarms and vice versa. The 3D torque between them would be reinforced by each of their 3D presentations. It would require a lot of energy to overpower this torque. The swarms would most likely arrange themselves into lattice formations whose structure would be determined by how their regions of SDU gravitational overlap were filled. (See **Intro to SDU Quantum effects** below)

This would be SDU electrostatic bonding

Set up a situation in which there are many small free moving objects each with predominantly Upper torque, similar to "plasma", in our universe. Place them between two large objects, one generating predominantly Lower torsion waves and the other generating predominantly Upper torsion waves. The region between the two larger objects would have a reinforced field compatible with motion towards the Lower object by the Upper plasma. Moreover since the Upper swarms are moving in the same direction they would tend to coalesce into streams because they are all moving in the same direction. Each swarm enhances the torque around it and becomes a region of higher torque so they all move into each other's wakes. If you could see the motion of this SDU plasma, you would observe streams of swarms.

As suggested above it appears that nothing is attracted or repelled within the SDU universe. Everything seems to simply follow the contours of the 3D interface. These contours would be in the form of torque around the 3D interface and as SDU gravitational indentations. It may be that the only true forces in the SDU universe are Intruder's advance between the Lower and Upper layers and the rotation of the parent 5D hypersphere. This advance causes the persistent backflow of Lower and Upper along the 3D interface and the rotation creates the species of vortices with opposite rotations on Lower and Upper 4D interfaces.

The Newtonian relationship F=*ma* could still apply if we define SDU mass as some value dependant on the quantity of vortices within the intensified torque and force as additional torque with its attendant shear vortices that accelerates the SDU mass. Therefore mass could change with variations of energy in proportions similar to that found in our universe.

John Wheeler said "matter tells Spacetime how to curve, and Spacetime tells matter how to move."

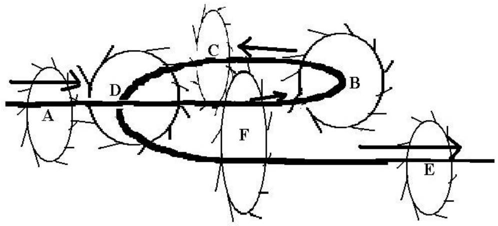
in reference to gravity. However if one considers that torque and drag may both contribute to the contour of the 3D interface (and therefore to Spacetime) then it should be considered that this concept may also be applied to SDU charge (see above), SDU magnetism and SDU quantum effects (see below).

I will discuss below the shape of Intruder$_L$ orbitals and their orientation to each other in this scenario under “Intro to SDU Quantum Effects” below.

SDU Magnetic Fields

Having setup the concepts regarding swarms I want to reemphasize the effects of the turbulent background. When there are no strong patterns of torque present, there are still enormous numbers of very transitory, random vortices being produced on all sides of the 3 and 4D sheared interfaces. In this situation the overall torque produced by these vortices has no particular orientation. But whenever a swarm with predominant torque is present at the 3D interface, that torque influences the orientation these transitory vortices as they are formed. For example take an Upper dominant swarm. Transitory Upper vortices on either sided of the Upper 3 and 4D interfaces will move in the same directions as the intensified vortices. Lower transitory vortices will move in the opposite direction. These new vortices, while not actually moving with the swarm, would contribute to and maintain the overall torque pattern in the extended volume.

The shear at 3 and 4D interfaces takes on the polarization of the vortices in the swarm’s predominant intensified. I have described this as a field. This is an important speculation because it would provide a way for waves of torque to be maintained as they traveled along the 3D interface even if the direction of the swarms of origin were to change or stop completely. If this were so, waves of torque could also be viewed as waves of polarized shear. These waves could be as long and as broad as our radio waves or as tight and compact as our photons.



At point "A" the 3D twist is clockwise. The interface rotates as the Intruder$_L$ swarms move through points "B", "C", "D" and "E". At region "F" there are two swarms moving in the same direction so the 3D interface is twisted the same for both.

Fig 48

Another effect of these intensified regionions and their associated torque can best be described by examining swarms in motion. I will go into why these swarms are in motion later but lets set up a situation where there are many single Intruder$_L$ swarms moving in the same direction along a strand or wire of SDU matter. The overall motion of their intensified regions is in the same direction therefore their torques become aligned. The sum of their torques creates overall twists within the surrounding 3D interface which influence the motion of any other nearby swarms that also have predominant torques. If their motions and their 3D presentations **are the same** as that of the strand swarms, these outside swarms will move closer and in the same direction. In fact they will accelerate as they move closer to the volume with greater torque nearest the strand. Remember that every vortex in its little bit of the 3D interface has this twist. The 5D fluids that meet at that little bit of 3D interface are shifted around it to varying degrees creating torque. The ovals around the wire in the diagram represent a uniform intensity of torque around wire. The angled line attached to it represents torque direction at that point of the 3D interface. The maximum torque occurs in the little bits of 3D interface nearest where the original stream of Intruder$_L$ swarms are flowing. The 3D interface becomes more and more twisted for any free Intruder$_L$ swarms that approach the strand of SDU matter. If they are traveling in the same direction they would accelerate. If they were traveling in the opposite direction from those on the strand they would move away and alter their direction.

I classify torque as either Lower or Upper. Above I suggested that the swarms above the Lower/Upper interface have torque opposite that of the swarms below this interface. So not only does each species of Intruder swarms have its characteristic torque but any trio made up of three swarms, that is a Lower swarm, Upper swarm and either a Intruder_L or Intruder_U will also have a torque that reflects the largest number of swarms present from either side of the Lower/Upper interface. Thus a trio made up of Lower, Upper and Intruder_L swarms will have Lower torque. A trio made up of Lower, Upper and Intruder_U swarms will have Upper torque.

Now back to the previous paragraph. All of the swarms moving along the wire described in this paragraph have Lower torque. If some freely moving unbound swarms in the region around the wire had Upper torque, while traveling in the same direction, these swarms would move away from the strand. When traveling in the opposite direction they would move towards the strand. Freely moving Lower swarms would move closer while traveling in the same direction and away if traveling in the opposite direction.

Swarms follow the same rules regarding contours of the 3D interface as the individual vortices within them.

Stop the motion of the strand swarms. They are now moving in a chaotic fashion rather than in one direction. There is decreasing aligned torque. As the interface readjusts it affects swarms nearby. For them, the interface is unwinding and so they reverse direction.

Force the swarms in the strand to move opposite the original direction. Peripheral swarms that had reversed direction in response to the initial unwinding now move closer in response to the total reversal of torque. Those that had not yet reversed their original direction yet, do so now.

These peripheral swarms also interact with each other. They produce their own torque. As they adjust to the torque emanating from the strand they also take positions aligning with each other. These would appear as concentrations or lines of torque around the strand. And they really are lines of increased torque but it is the additional torque generated by the freely moving swarms themselves, not simply torque from the wire. This would most easily be seen when the peripheral swarms were attached to some larger entity such as an analog to iron filings in our universe or in patterns of SDU plasma as seen in SDU stars.

A point should be made here regarding SDU magnetic "lines of force". They would be a useful device for mathematical evaluation but within the SDU universe they have properties similar to isobars in barometric values or the contour lines delineating altitude on a topographical map. The measurement should be the same for either concept. If one allows that adjacent "lines of force" represent a change in torque intensity of some arbitrary value, a small change of intensity within a range of distance could be represented by a few "lines of force". A large change of intensity within the same range would be expressed as many "lines of force". This would be analogous to very few contour lines in a distance of gradual incline on a topographical map or many closely spaced line delineating a steep incline with in the same distance on the same map.

A second point should be made regarding the directionality of the SDU magnetic field relative to the motion of the Intruder$_L$ swarms. Within the SDU universe it is caused by the contour of the torque around the moving Intruder$_L$ swarms. In our universe it is attributed to the flow (flux) of the magnetic field relative to the motion of electrons. It is suggested below that many effects for each should be similar.

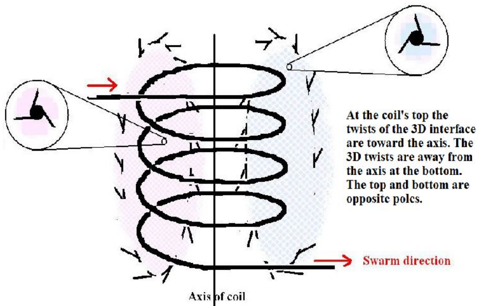


Fig 49

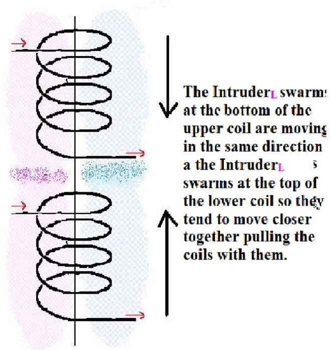
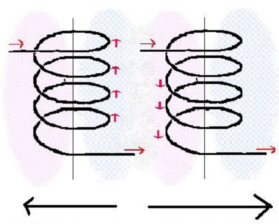


Fig 50



The Intruder$_L$ swarms on the right side of the first coil are moving in an opposite direction to the Intruder$_L$ swarms of the left side of the second coil so they tend to shift away from each other dragging the coils with them.

Fig 51

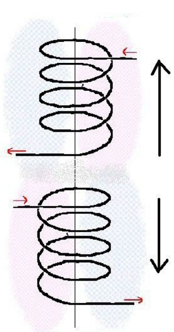


Fig 52

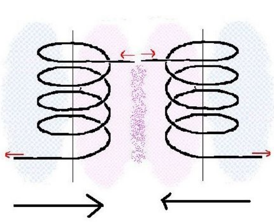


Fig 53

Now create a coil out of the wire (Fig 49) and set the Intruder$_L$ swarms in motion. They are moving parallel to each other and their torque is cumulative. The space around them is more highly polarized. The emergent pattern of toque is a fat cylinder, whose torque is always perpendicular to the direction of the swarms with their Lower twist. The stylized magnifications emphasize that that every little bit of the 3D interface has the indicated torque, The Intruder$_L$ swarms moving away from the viewer have a clockwise 3D presentation. Those that are moving towards the viewer have a counterclockwise presentation.. They all have Lower torque but their motion along the 3D interface alters their 3D presentations.

The region within the coil should have a region of interference if there is no conductive or SDU magnetic material present. However the presence of a core that contains Intruder$_L$ swarms that could imitate the circular pattern of the Intruder$_L$ swarms in the coil should somewhat neutralize this interference and actually enhance the torque pattern generated by the coil.(I say “somewhat neutralize” the interference because if the current is high enough the interference could overpower the structure and cause it to fly apart.)

This also raises the possibility that if one creates a toroidal structure of SDU magnetic material in which a portion of it is passes through a coil, the pattern of circular motion would be induced to spread throughout the torus. This would result in a continuous field of torque within and out side the torus. A second coil around the other side of the torus would also respond to the field. This could be the basis for a SDU transformer .

Thus if we place an analog to an iron bar in the center of coil above, the pattern of torque should be enhanced.

Make a second coil as above (Fig 50). All coils have a bar of SDU iron in their center. It is left out of the illustrations for clarity. When they are brought together end to end with their Lower torques aligned and both sets of swarms are traveling around their cores, let's say clockwise, they tend to move towards each other because the swarms of the same species moving in the same direction tend to move toward each other. The torque pattern of the right side of each coil is clockwise and on the left it is counterclockwise. All of the swarms are traveling away from the viewer on the right side and towards the viewer on the left. The more intense colors between the coils suggest that the torque between them is reinforced. The swarms tend to move toward regions of higher compatible torque.

Move the second coil to the side of the first (Fig 51). They tend to move away from each other because the swarm sets on the adjacent sides are moving opposite each other. The torque on one of the adjacent sides is counterclockwise, the other is clockwise. The muted colors between them are to suggest a region of interference or interface relatively free of torque. The swarms will move into those regions that have higher compatible torque which in this case is away from each other.

Create a new set of coils each of which has Intruder_L swarms traveling along their wires in directions opposite the other (Fig 52) If they are brought together, end to end, their Intruder_L torques are in opposite orientation , they will tend to move away from each other because the sets of swarms are now traveling in opposite direction.

The torque between them experiences interference. Each coil has greater compatible torque in all of the other regions except the one where they nearly touch. Their Intruder_L swarms drag them away from each other.

If these new coils are brought together side by side (Fig 53) they will tend to move toward each other because now the swarm sets on adjacent sides are moving in the same direction. Swarms (and swarm sets) of the same species or torque tend to move way from each other when traveling in opposite directions and towards each other when traveling in the same direction.

One should also be able to apply the above concepts to permanent SDU magnets made out of material in which the circular motion of Intruder_L swarms is maintained after it is once established.

A reminder is appropriate here regarding the polarization of the 3D interface shear around all of this activity. Above, I envisioned that shear is creating new random vortices everywhere, not just within the swarms and that these new vortices should tend to align with the torque that is already present and in that way intensify it. That is they will have the intensity and orientation of the torque that is present where they are created. Those created further away from the primary activity will form and maintain weaker torque but they will still have the same orientation. Those nearby will form and maintain stronger torque. This effect would be important in the long distance transmission of reversing SDU magnetic fields. In this case the large scale polarization of the 3D interface should maintain these traveling waves. This large scale polarization could be similar to radio waves.

Intro to SDU Quantum effects

There are several ideas that I need to consider when I describe the rules regarding SDU quantum effects.

1. The effects of torque waves on swarms outside of their virtual wells.
2. The effects when swarms are sharing or nearly sharing the same virtual well.
3. The stacking patterns that might result from effects 1 and 2.
4. A semi Pachinko effect
5. Not so spooky action at a distance

In the description of SDU charge I mentioned that the nearby 3D interface around swarms is full of fluctuations created by swarm orbital motion. These fluctuations are not caused by the addition or removal of vortices within the swarm simply by a shifting of available torque. Here there is no loss or gain of the systems energy but they do allow what we would see as quantum effects.

I envision the 3D indentations caused by the swarms as of two types. One is that of very shallow wide indentations associated with single eye presentations such as Intruder_L swarms (analogous to electrons). The others are progressively deeper indentations associate with Trios and Quartets analogous to nucleons. These indentations become deeper than Intruder_L indentations, as mass is added to small regions of the 3D interface. Single Intruder_L or $_U$ swarms have relatively few vortices when compared with the numbers within Trios or Quartets. The difference is even greater when compared with those that makeup the conglomerates as discussed below. It is the vortices after all, that create the drag on the advancing Intruder. So it stands to reason that those configurations that have greater SDU mass will also have deeper more defined indentations.

The deviations of these indentations appear to face everywhere along the 3D interface because they actually deviate in a direction perpendicular to the 3D interface.

The deeper indentations create an interesting situation for everything nearby along their interfaces. All sides of these “virtual wells” are highly influenced by the backflows of the Lower and Upper fluids. This means that the intensified torques of all swarms on one side within an indentation must be oriented in the same way to compensate for this consistent flow. They must all travel in the same direction against the backflow. They may spin clockwise or counterclockwise when viewed within 3D space and because all vortices within the wells are forced to travel in the same direction against the backflow, they will follow only the rules that apply to vortices moving in the same direction. I will call the demarcation zone between the edge of the indentation where backflow begins to dominate and the flat 3D interface where backflow is totally perpendicular, the “selective horizon” because it will determine the orbital shape of outsider swarms which are in this case the Intruder_L swarms (SDU electrons).

Outside the selective horizon swarms will follow all of the general rules regarding those with opposite and similar 3D presentation.

Below the selective horizon swarms will follow only those rules that apply when they are moving in the same direction.

Specifically:

1. Vortices with the same 3D presentation will move closer together. Their swarms (Trios and Quartets) will tend to become attached in a side by side configuration as much as the horizontal space within the orbital indentation allows. When these swarms form this configuration, they would release energy (see SDU strong force below) Swarms that are captured without forming attachments (that are stacked vertically within the well) will not lose energy. This will result in some reaction

being exothermic and others being endothermic. These swarms will also require substantial energy to escape. In fact distortion of the indentation would be the most likely method for Trios and Quartets to escape. These effects are covered in greater detail in the sections regarding SDU strong, SDU weak and "Splash".

2. Swarms within the selective horizon vortices with opposite 3D presentation will move away from each other. Swarms with lower mass will tend to be ejected.

I will concentrate on these effects as they apply to $Intruder_L$ swarms at this point in the paradigm. Any $Intruder_L$ swarm entering a $Trio_U$ orbital indentation will be in a flow that forces it to travel in the same direction as that of the $Trio_U$. This would be the direction expressed by the out going waves of $Trio_U$'s polarized shear. The $Intruder_L$ and $Trio_U$ swarms have opposite 3D presentations and therefore the lighter $Intruder_L$ swarm is ejected but the pattern does not end here.

$Intruder_L$ swarms approaching Upper dominant $Trio_U$s from out side these selective horizons will follow the constructive interference before they crossover the selective horizon because their 3D presentations and directions while out side the well are opposite that of the $Trio_U$ swarms within. Both swarm types at this point are moving in opposite directions. Outside the selective horizon their torque has constructive interference. But once the $Intruder_L$ swarms go over the selective horizon, they are in the same Lower/Upper backflow as that of the $Trio_U$s and their intensified torques must shift accordingly. Now, swarms with opposite interface presentations are traveling in the same direction against the backflow. There is destructive interference between them. The $Intruder_L$ swarms tend to move back onto the interface with the most compatible torque, which is outside the selective horizon. Once there, they can easily reorient themselves and again assume a direction that is opposite that of the $Trio_U$s. So the pattern is; outside the selective horizon they move towards the $Trio_U$s, once inside the selective horizon they move away, outside, toward, inside away, etc, etc. If there were no other factors to consider they would simply bounce around the edge of the well in purely random fashion and while this is part of the story there are other factors to consider. Both swarm sets are rotating within their respective indentations, so the torque patterns they impose onto the sheared background is that of polarized waves moving outward. One way to visualize their wave fronts is see them as developing expanding layers (each layer is a wave) from the bottom up, radiating outward from the core (like the layers of an onion). I will concentrate on Trio$_U$ waves because it is easier to consider only one wave source at a time.

Waves are spiraling outward but between these waves are relatively chaotic semi nonpolarized regions traveling with them. So Intruder$_L$ swarms respond to the polarization by moving towards the Trio$_U$ and continue until a new wave arrives. If they are still outside the indentation they will continue in that direction until another wave arrives.

If the Intruder$_L$ swarm was quite a distance from the Trio$_U$ swarm this will continue for some time until its SDU inertia carries it over the selective horizon. The Lower/Upper backflow here is such that its primary torque must shift and reverse direction just to stay in free fall but as a new wave passes by, the swarm experiences only destructive interference and it accelerates towards the outside. It continues in that direction until a new wave passes by. If it is still within the indentation it will continue to accelerate away until it is past the selective horizon and soon after it will again turn towards Trio$_U$ when new waves pass through. It will continue back and forth over the selective horizon until it achieves a velocity and orbital shape that allows it to resonate with these waves for the most part. I have to consider here the Intruder$_L$ swarm's motion and position within it own orbital as a factor in determining where these resonances happen. If one is pushing a swing but the swing is in the wrong position, the push has no effect so it is easy to see why these resonances could happen. But an orbiting swarm is more complicated. If within the swarms own orbital, its velocity is such that it has a 3D presentation that is compatible with particular wave of polarized shear it will move towards the core. If its presentation is not compatible it will move away from the core. All of the waves coming from the core have the same orientation so the variations in an Intruder$_L$ swarm's orbital position and the resultant changes of its 3D presentation would be why it fluctuates with alternate waves coming from the core. Any changes in it orbital size due to added energy would need to agree with these fluctuations. Other wise the energy would not be absorbed. So its orbital change could be one wavelength in diameter or two or three etc but never a fraction of a wave length. In this way it could absorb only SDU photons with specific energies as it is driven to higher or wider orbitals. And likewise it could only release SDU photons with specific energies as it falls to lower or smaller orbitals.

It probably would not be locked into these resonances. Any fluctuation of the interface could send it careening away from its base positions but it would very likely return to this state because of the regular passing of $Trio_U$ fluctuations. So the picture here is of a somewhat indefinite orbital with a preferred region of occupation near an attractor at the indentation's selective horizon. This would be its base orbital or state of lowest energy.

$Intruder_L$ swarm's orbital paths need not to be confined to circles with the core at their center. They could be to one side and have paths that are elliptical, parabolic or hyperbolic where one focus is somewhere along the selective horizon. Orbits created by our gravity are not analogous to these orbitals. Planet orbits are sun centered because its gravity is constant whereas the swarm orbital configurations are determined by fluctuating polarized shear.

As parabolas or hyperbolas they could continue to infinity when given very high energies but at lower energies they would respond to the waves of polarized interface from the core by returning to and reentering the selective horizon where they would again be ejected to follow a shifted orbital path. This concept raises the possibilities of many orbital shapes that could be determined solely by their velocity and resonance with the core and other $Intruder_L$ swarms within the system.

These orbital shapes will also be influenced by the lattice of interference patterns that develop from multiple $Trios_U$ (SDU protons). Orbitals of $Intruder_L$ swarms above lowest level swarms will encompass patches of reinforced interference created by orbital fluctuations of the core and lower swarms. In these cases their orbital shapes could be barbell or other unexpected forms. This is facilitated by the pendulum like nature of the eye and the swarm's capability of generating multiple or split presentations of the eye. The main body at the 4D interface remains coherent.

The 5D properties of a cylindrical Intruder$_L$ swarm would allow configurations that would not be apparent or even allowed within a purely 3D construct. If it receives more energy and velocity, its base could temporarily occupy higher or wider orbitals. As suggested above these higher orbitals would not need to have the core at their centers. They could be of a variety shapes based on various conic sections with the foci of the smallest orbitals somewhere along the selective horizon. Under some circumstances these orbital could be "permanent" under others very short-lived.

The shapes of these orbitals would depend on the velocity and spin of the Intruder$_L$ swarm(s). The base orbitals would appear to be spherical in that they could be rapidly shifting cones with indeterminate positions creating a fuzzy sphere that delineates the selective horizon. Other orbitals could be twin spheres or cones occupying two sides above the base orbital.

They could resonate between regions that are on opposite sides of the base state orbital. Their cylindrical pendulum like property. These could only be viewed from 5D space. They could shift back and forth over the 3D interface rapidly with ease and follow a distorted figure eight pattern that allows them to take on opposite orbital spins on opposite sides. I say distorted because I don't see how they could leave the 3D interface at any time. So the crossover point might be very near the selective horizon while the lobes with opposite spins would be on opposite sides. This could be one example of SDU superpositioning. Another speculator may come up with a more satisfying solution.

As suggested above orbital diameters and shapes would need to be resonant with the waves radiating from the core and other Intruder$_L$ swarms. The orbital could be one wavelength in "diameter". Or it could be two wavelengths in "diameter". Or it could be three wavelengths in "diameter" etc. These "diameters" would determine the orbital apogee from the selective horizon. Apogee in this context includes the point at which Intruder$_L$ swarms reverse their outward parabolic or hyperbolic paths in response to waves from below. They could then follow a shifted parabolic or hyperbolic orbital path with a new focus point on the selective horizon or they could follow a funnel shaped orbital in which the wide portion faces away from the core and the narrow end is at the selective horizon.

Intruder$_L$ swarms around the more complex cores would also need to follow these principles of resonance with their cores. Their orbital diameters would also need to be multiple wavelengths of the complex core's orbital spin. The presence of other Intruder$_L$ swarms would also influence their orbital shapes.

Another factor to be considered is that the 3D contact and presentation of a hyper cylindrical IntruderL swarm is that of a sphere and it orbital path will also be some form of sphere not simply a circle. It will be suggested below that when there are multiple connected Trios$_U$ swarms, they can interact with multiple Intruder$_L$ swarms. The 3D presentations of these Intruder$_L$ swarms will have packing appropriate to the situation.

Stacking

Core Trio$_U$ swarms are the nucleons within the SDU. As implied above they have their own orbitals in response to the back draft from the Intruder advance. Motions within these orbitals create the fluctuating waves that control the Intruder$_L$ swarms' orbitals.

Cores with only one or two connected Trio$_U$ swarms (I am ignoring Quartet contributions for now) allow one or two Intruder$_L$ swarms to occupy a region of SDU gravitational overlap that surrounds the entire core. Their positions in this region would be indeterminate because none of them could keep up with the orbiting core swarm. They are simply controlled by the waves of torque passing by them changing directions as appropriate. This region while somewhat indefinite could be very large. The presence of the Intruder$_L$

swarms would encourage the Trio_U swarms to move closes together. The size of the core would be minuscule when compared with its region of SDU gravitational overlap. Intruder_L swarms occupying this innermost sphere would need to have opposite spins because that is the only orientation that allows two Intruder_L swarms to have the same 3D presentation on their adjacent sides. This is a SDU "Pauli exclusion principle". These Intruder_L swarms would occupy a SDU "1s" region of SDU gravitational overlap.

Cores with three or four connected Trio_U swarms will allow three or four Intruder_L swarms. The third and fourth Intruder_L swarms would form a second large irregular concentric sphere outside the first. They could not share the inner sphere because they would have the same spins as the swarms already present. Even here their spins would have the effect of limiting the motion of the inner Intruder_L swarms. However swarms with the same spin could switch places between regions. The higher swarm would simply pass energy to the lower. These would be SDU "1s" and "2s" regions of SDU gravitational overlap.

Intruder_L swarms would also have opposite spins if they occupied cones on opposite sides of the core. In this way their spins could still be compatible with the core and each other if they come in contact.

Five or more Trio_U swarms would allow five or more Intruder_L swarms. The additional Intruder_L swarms would still be able to occupy the second spherical region of SDU gravitational overlap but they would break it up because the region is so large. No individual swarm in this region could follow an orbital all the way around the core in the time it takes for one orbital revolution of the core. They could form similar SDU "1s", "2s", "2p", and tetrahedral hybridization configurations that are allowed for electron packing in our universe. Why tetrahedrons? Because the large Intruder_L swarm spherical regions of SDU gravitational overlap would be packed around the central Trios_U most efficiently if they formed tetrahedrons like oranges at a fruit stand. As the cores are enlarged, other Intruder_L swarms could join them if they took on the opposite 3D presentation that is, they had reverse spins (see how Intruder$_L$ swarms can move together above). In this way the tetrahedron pattern could accommodate layers of eight Intruder$_L$ swarms. As cores are enlarged each new layer of the additional Intruder$_L$ swarms would attempt to continue this packing. Irregularities in packing are likely to occur frequently as layers are added because additional connected Trios$_U$ and Quartets and their complementary Intruder$_L$ swarms alter the shape of the region of SDU gravitational overlap.

This suggests that SDU bonding could be described as regions of Intruder$_L$ swarms' SDU gravitational indentation overlapping while belonging to different cores. These overlapping or shared gravitational indentations could bind adjacent cores together.

A semi Pachinko effect

The picture I have presented one in which all objects including SDU photons are the centers of fields of polarized shear. The shapes of these objects whether "charged" or neutral" will determine the shapes of these fields. What's more whenever these objects are in motion, polarized shear perpendicular to the direction of this motion is propagated at the speed of SDU light but the components parallel to the motion direction will move at the speed of the object. This is because the vortices of the polarized shear will have the same orientation and speed as those within the intensified torque of the object. The numbers of these polarized vortices within the shear will decrease with the square of the distance but each individual polarized vortex will have the same energy and velocity as that of the intensified segment at that point. So the picture here is of a field extending away on all sides of a moving swarm, swarm conglomerate or SDU photon. If the SDU matter object has a predominate torque, its polarized shear would be apparent as a SDU magnetic field. It would also have the characteristic rebound waves of a "partially collapsing" SDU magnetic field. This suggests that it would have a series of waves, one powerful, followed by a second weaker wave.

The object could also be neutral when it has intensified torques that contain equal numbers of Lower and Upper vortices, for instance waves generated by Intruder$_L$ swarms interspersed with

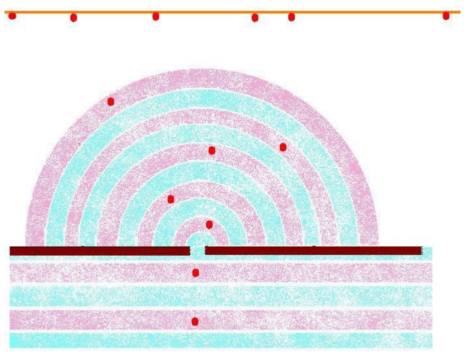


Fig 54

Upper predominant waves of torque generated by Trio$_U$ core elements . In this case the field would still exist but the conglomerate would not interact with charged objects. These fields move with the objects because as stated above their vortices match those within the intensified torque of the objects.

When these objects (eyes) pass though a single vertical slit, the horizontal aspects of these fields have properties of a water wave passing through a slit in a barrier (Fig 54). They spread out in circles. If the object continues forward, the waves would eventually become perpendicular to the direction of motion but a swarm's motion with its eye would now be perpendicular to some arc of the original circle. If a detector was placed at some distance from the slit, it would exhibit a spray of particles.

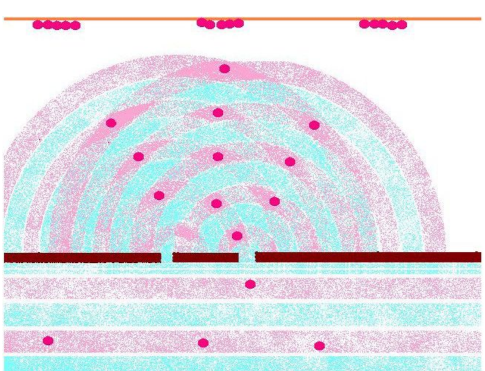


Fig 55

Place a second slit in the barrier close to the first (Fig,55). When the eye of a swarm enters one slit, a detached wave of polarized shear enters the second. This detached wave would normally dissipate by spreading out on the sides but here it changes shape into an arc. So the suggestion here is that waves of polarized shear associated with the object spread out as two circles and like water waves these circles interact with each other to form regions of constructive and destructive interference. It doesn't matter which advancing circle contains the eye, it will tend to follow the constructive interference created by secondary waves as they interacts with its wave. The region of constructive interference it follows could be determined by its motion and position within its indentation when it enters the field. Its pendulum like nature, could also allow it oscillate between regions of constructive interference while moving within the field. All of this would tend to limit which regions that it would hit on a detection screen. The pattern of lines that develops would reflect the pattern of interference created by the circles of polarized shear. It is the probability inherent in this pattern that would determine where individual objects are likely to hit the screen. Changes in the position of the detection screen could very well determine where the swarm would strike. The act of observing would force a result. Furthermore an observer within the SDU universe could not tell where individual objects were within the pattern until they struck a detector. An observer outside the 3D interface could watch their progression “down the shifting Pachinko board”.

The polarized shear should also accompany collimated, coherent beams of SDU photons and even individual SDU photons. This raises the possibility that individual SDU photons could behave as coherent beams when passed through a Mach-Zehnder interferometer because the attendant wave of polarized shear could be split and reflected. The SDU photon could continue to travel with either half of the wave but if this wave ultimately interferes destructively with itself, it could also interfere with the SDU photon rendering it undetectable.

SDU photons are described below as series of alternately escaping sheets of shear vortices responding to and reinforcing a wave of torque. It also been noted above that this wave of torque has additional shear vortices as a field on either side. This is the field of polarized shear that I describe as a part of individual SDU photons.

A mechanism will be suggested below that allows SDU photons to transfer energy to and from swarms. These energy transfers should always reflect the changes in velocities of swarms as they change orbitals. And since the orbital must resonate with the cores, the SDU photons emitted or absorbed should always have the same energy and wave length for a particular change in orbital within a specific core.

A not so spooky action at a distance

So far we have only explored the transverse waves that move along the 3D and 4D interfaces. I want to briefly think about the longitudinal waves that might travel within the Intruder, Lower and Upper fluids. These would be analogous to the pressure waves that travel in the fluids of our universe such as sound. Sound waves within the water of a pond travel much faster than the slow transverse waves at its surface.

These waves should also be confined to the region between the adjacent 4D interfaces that define the advancing Intruder because here there is a change of media. So there is the likelihood of resonant interaction with other vortices formed along the 3D interface. However one looks at it, there should be intense longitudinal wave activity between vortices, swarms and SDU photonic structures around the region of shear. This would provide additional stability to structures determined by torque.

Some potential properties of these longitudinal waves are suggested below.

They could very well travel 7.57 times the speed of SDU light as suggested in the Science News article “Holism and particlism in physics” (SCIENCE NEWS, VOL. 129 #5 pg 70 February 1, 1986). This article was about the “Bohm quantum potential” that Einstein called “spooky action at a distance” and it was the only one I could find that assigned a definite speed to the Bohm quantum potential propagation. Others, references that I have found, simply refer to it as instantaneous or nonlocal and I suggest here that sometime the term “nonlocal” is simply imposed upon that which cannot be measured with our present tools

The SDU Bohm quantum potential waves associated with the SDU universe could have more complex configurations and motion than that allowed the longitudinal waves in our universe because they are 5D phenomena. Sound waves in our universe while being longitudinal wave forms have curved planar (2D) fronts. Within the model, SDU Bohm waves are also longitudinal but they have curved hyper volumetric (4D) fronts.

The extrapolation goes something like this:

Longitudinal waves traveling within a plane (2D) will have a linear (1D) front

Longitudinal waves traveling within a volume (3D) will have a planar (2D) front. Longitudinal waves traveling within a hyper volume (4D) will have a volume (3D) shaped front.

Longitudinal waves traveling within a 5D hyper volume will have a 4D hyper volume shaped front.

It seems likely that a 5D longitudinal wave could carry information that reflects the SDU quantum states of resonant objects such that any changes in one object would cause changes in other. These objects could be the individual vortices within a swarm, whole swarms, swarm conglomerates or SDU photonic wave trains.

These resonances between pairs of vortices, swarms or SDU photons could easily be broken by outside interferences.

A SDU Bohm quantum potential pressure wave (SDU pilot wave?) could be hybridized in that it could distort adjacent interfaces to form contours similar to transverse waves but it would travel much faster. Any actions imposed by one object upon another through the intermediation of these pressure waves would appear to be instantaneous to the occupants of the SDU universe. And since “nothing can travel faster than SDU light”, it would seem to be “spooky action at a distance”.

Individual vortices within waves of polarized shear could also have additional connections by SDU Bohm quantum potential pressure waves.

SDU Bohm quantum potential pressure waves could contribute to the resonances within

Individual swarms

This could include the components of Trios and Quartets.

These could include resonances with the components of multiple Trios, Quartets and “free” Intruder swarms, thereby influencing orbital positions, quantum states and resonances of all SDU atomic and SDU molecular structures.

All of this may seem to give these internal waves too much credit until we consider that all vortices are immersed in 5D fluids and that there must be some interaction within the fluids that define the interfaces, particularly between and within the 5D cylinders as they travel up the 4D interfaces through the Intruder. We are familiar with sound’s potential for resonance in our universe. I believe that similar principles could operate here except the potential for much more complex wave configurations should be available in a 5D fluid.

The resonant factor could be something like this. I will use two unattached Intruder_L swarms traveling together for the sake of simplicity. They can only travel together if they have opposite spins but it’s a wild SDU universe out there and there are many situations that could cause one or the other to alter its spin. If the only communication between them is the polarized swarm torque, the swarm with the change in SDU quantum state might end up going its own way. But as it changes it SDU quantum state it initiate a change in the SDU Bohm quantum potential resonance between them such that the second swarm reverses its quantum state to compliment the first. Allow that changes in the SDU quantum states are going on all of the time with the Intruder_L pair and that the SDU Bohm quantum potential resonance maintains their complimentary states continuously by reversing the state of each as the other changes. Create a situation where the pair becomes separated but maintain their SDU Bohm quantum potential resonance (SDU entanglement). Let one Intruder_L swarm interact in such a way that its last SDU quantum state becomes a base state. It has been observed. The wave goes out that it has a change in SDU quantum state. The second swarm responds but the resonance is broken. If the second swarm is observed now, it has the SDU quantum state that complements the first swarm's SDU quantum state. But this didn't happen until one of them was observed or forced into base state. These principles should apply to any swarm pair configuration (cylinder SDU matter or SDU photons) that have complimentary quantum states that are maintained by SDU Bohm quantum potential resonance.

So the model has evolved to one in which the different SDU universal components restricted and guided by torque of the 3 and 4D interfaces and resonant SDU Bohm quantum potential waves within the Intruder fluid or "sonic boom" analogs within the other two fluids.

I use the "sonic boom" analogy because if Intruder is advancing many times faster than SDU light the SDU Bohm quantum potential waves would move back through Intruder at their normal speed (7.57 times the speed of SDU light) relative to the advancing interface. But in the Lower and Upper fluids they would be pressed against the advancing 3D interface.

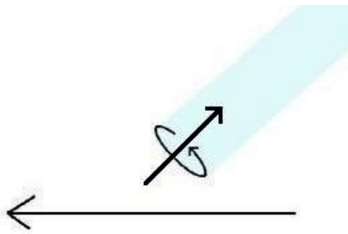
In SDU light the SDU Bohm quantum potential waves would move back through the Intruder fluid at their normal speed. But in Lower and Upper fluid their speeds in the lateral directions along the 3D interface could very well be different. In Lower it might be faster and in Upper slower because of their different densities.

So the eye of a swarm (which may also be viewed as a particle) is not only influenced by its swarm but also by the cacophony of waves traveling along the 3D interface and waves within its surrounding 5D fluids.

All of this activity within the fluid layers should also influenced the probability of any event through momentary resonances.

Intrinsic and Orbital Spin States within the SDU

All of the centers or eyes of tubular swarms (fermions) would have a tilt (Fig 56) that is,



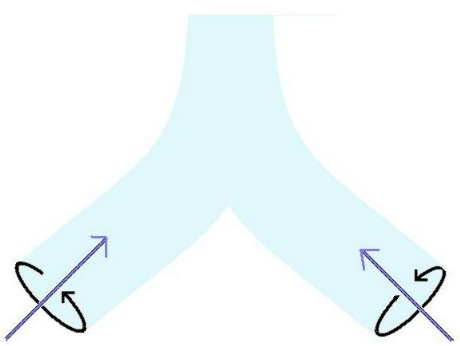
Spin + or - 1/2 as eye of swarm moves.

Fig 56

their spin axis are not perpendicular to their direction of motion along the 3D interface because they are being dragged by the activity there. This would give them intrinsic spins of + or - 1/2.

This property would carry over to their orbital spins (Fig 57).

Orbital spins are also determined by the constructive and destuctive interference within and around cores with multple Trio$_U$ nucleons in concert with the activity of Intruder$_L$ swarms. Within this model nucleonic swarms also have orbitals but they are extremely confined when compared with wide ranging orbitals of Itruder$_L$ swarms. Never the less they can produce fluctuating interference patterns which determine what regions Inruder$_L$ swarms may occupy on the 3D interface. The Intruder$_L$ swarm activity in turn can also influence orbital configurations of nucleons although to a lesser degree. Regions of constructive inteference would allow Intruder$_L$ swarms to resonate between multiple positions on the 3D interface (Fig 57). Greater numbers of nuceons within a core create more complex interfernce patterns on the 3D interface around it and therefore allow more potential orbital states for Intruder$_L$ swarms.



Spin as eye of swarm resonates between two regions of the 3D interface.

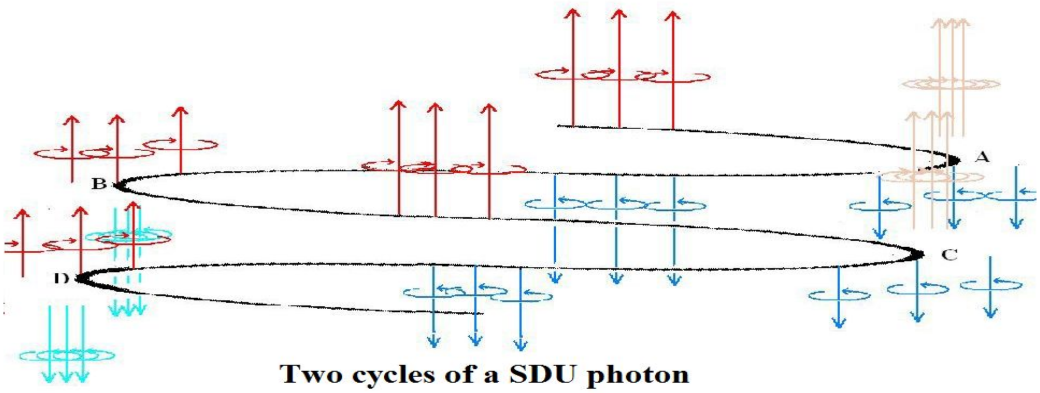
Fig 57

I wish to reemphasize the influence of orbital resonances on the allowed spins present in these structures. The orbital sizes and orientation are only allowed where resonances permit. If a potential orbital position is dissonant (destructive interference), an Intruder$_L$ swarm will shift to one that is resonant (constructive interference). Energy sufficient to raise a swarm to only a dissonant position will not be absorbed. Energy sufficient to raise a swarm to a resonant position will be absorbed. Energy released when a swarm drops from one resonant position to another will always be the same.

I realize that quantum mechanics is considered to be counterintuitive but within this model one can accept more readily accept the Intruder$_L$ (SDU electrons) cloud patterns associated with quantum numbers without knowing the mathematics involved. I'm not saying that one could determine cloud structure without the mathematical models, only that the models described would not seem unreasonable to the layman.

SDU photonic patterns

Figure 58 is an incomplete introduction to SDU photonic structure. Not all of these SDU structures would be recognized as photons in our universe. SDU structures could exist on any or all sides of the connecting 4D interfaces. The species we would recognize as SDU photons would occupy the interiors of the Intruder's connecting 4D interfaces.



Two cycles of a SDU photon

Fig 58

Recall that the torsion wakes have rotary motion that matches their associated vortices. This rotary motion reverses when the wakes reach their maximum and begin the path to their minimum. Any vortices that were present during the first half of the wake cycle are in conflict and must escape up the 4D interface. Background shear then provides new vortices with compatible rotation (Fig 58).

The wavy line represents torque intensity (not actual torque) and implies the change of torque rotary motion along the 3D interface as the wave moves through a region. The arrows represent vortex attachment and escape. The original vortices that produced torque have escaped at “A” as the interface starts to rebound reversing the rotary motion of the torque wave. Background shear generates new vortices (red) with orientation that is compatible with the rebound. The interface continues to twist with the help of these new vortices until it reaches the limit allowed by its geometry at which point in time “B” it starts to rebound or unwind, reversing the direction of its torque, forcing the first vortices to escape (pink). Shear generates a second vortex group (blue) with orientation that is compatible with this torque which is maintained with the help these vortices until it again reaches the allowed limit at which point “C” it starts to unwind reversing torque, forcing the second vortex group to escape (light blue). Shear generates a third vortex group (red) with orientation that is compatible with the new torque rotary motion. The interface continues to twist with the help of this group until it reaches the allowed limit at which point “D” it starts to unwind, reversing its torque, and so on until the wave train of torque has passed.

This is one aspect of this diagram. The second very important concept is that vortices in each new group are spread out when they are initially produced by shear. This reflects the tendency of the concentrated torque to spread out as it starts to reverse. Vortex property forces them to shift together within the same torque field. This causes the torque to become reconcentrated in such a way that it is highly concentrated by the time each group of vortices escapes.

The SDU photon continues along the interface in this way. As a wave of torque passes along the 3D interface, the ever present shear creates vortices in response. This is a highly concentrated form of polarized shear. It is also accompanied by a more generalized form of polarized shear in regions outside the region of concentration. The diagram below (fig 59) is another view of a SDU photon that emphasizes the property of vortices with the same 3D presentation that causes them to move towards each other.

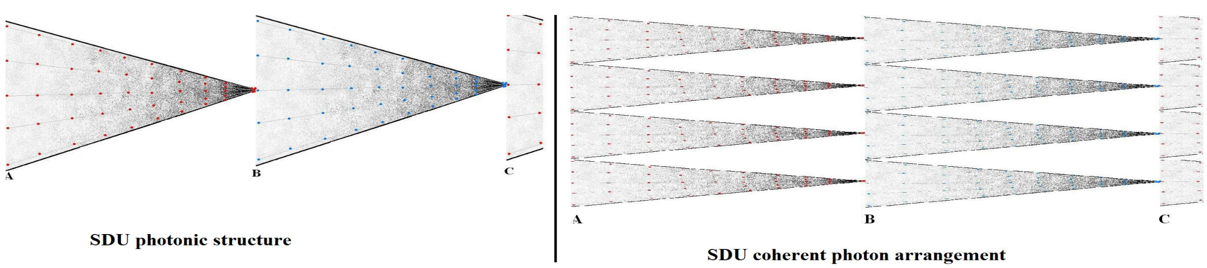


Fig 59

The dots Figure 59 represent a sampling of shear vortices involved with this activity. The diagrams don’t show their horizontal motion which would align with the wave of torque right to left. Instead each vertical row represents the relative position of the vortices at various times in the wave’s phase as the adjacent 4D interfaces are twisted around their common 3D interface.

Time “A” shows the beginning of the phase. It would be the initial effect of a rebound wave on the polarized shear. The 3D interface has started to untwist from a previous maximum torque rotation. This has the same effect on vortices within this field as that of torque applied in the opposite direction. Shear creates widely spaced compatible vortices (red dots). As the 3D interface continues to untwist they shift closer together.

By the time 3D interface has reached the point of equilibrium the vortices are not only moving with the wave but they are accelerating towards each other and in the process they are concentrating the torque field in the same rotation as the first rebound. This additional torque forces the interface to continue its twisting in this new direction until it can twist no more.

At time and phase “B” the interface is forced to begin a second rebound. The old vortices escape up the adjacent 4D interfaces leaving behind the rebound. Shear creates a new set of vortices (blue dots) compatible with the new direction of torque rotation. These new vortices continue to behave as those in the previous phase of the SDU photon, transforming the “B” rebound into a concentrated field of torque until the 3D interface reaches its maximum allowed twist. These vortices escape and a new phase starts (time C). The effect here is similar the collapsing magnetic fields in our universe in which electrons reverse their direction of motion as soon as the field starts to collapse and then continue in that direction as the field increases with the reverse polarity. In fact if the SDU photon is absorbed by a swarm and there is no rebound, the field would be described as having collapsed, in our universe.

I have shown only five shear vortices. There would be many, many, many more but available shear and the allowed limits of the displacement around the 3D interface could still ultimately restrict the numbers of shear vortices that could participate in any single phase of a photonic cycle.

Shear would also slow the wave of torque down. Without shear, torque waves might travel much faster but they would also lose energy to the connecting 4D interfaces. With shear, this loss is prevented because the waves are reconstituted during each of their phases. And as a consequence, the speed of SDU light (and everything else) is also restricted by available shear and allowed vortex densities.

This property of vortices clumping or aggregating together in the presence of torque will cause some wave fronts of torque to breakup into particle like objects rather than spread out as would be expected with traditional transverse waves. These aggregates and their associated radiation are literally soft, hard or extremely hard. This is not a metaphor. They could achieve vortex densities similar to that next to the eyes of SDU matter. These densities would be proportional to the torque present.

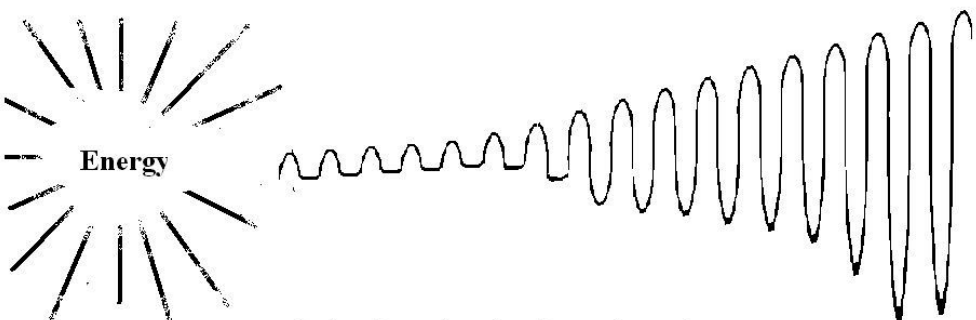
As mentioned above, these aggregates could develop on any or all sides of the 4D interfaces. The same torque could be condensed by any combination of vortices on any sides of these interfaces. All vortices would shift towards the highest concentration of torque. Their 3D direction of motion would be the same but their rotational directions could be opposite. This rotation would depend on which side of the Lower/ Upper horizontal in which they were generated. That is, under the same torque, the 3D presentation of Lower vortices might be a clockwise rotation while the 3D presentation of Upper vortices would be a counterclockwise rotation.

The adjacent 4D interface limits of displacement are imposed by the high speed advance of the Intruder and pressures by the adjacent fluid layers. Additional torque or energy could be applied but the effect would be of more rapid rebounds not equivalent interface displacements. As energy become progressively more intense the amount of additional interface displacement allowed becomes progressively less. This causes higher energy rebounds to be more rapid so higher energy USD photons should have more rapid cycles or frequencies and shorter wavelengths. Lower energy USD photons would have slower cycles, lower frequencies and longer wavelengths. This is similar to what we have found in our universe.

The maximum allowed angle of 4D displacement about 3D space could be expressed as some value times 2π and in this way could be a constant somewhat similar to our Plank's length. I am also suggesting that layers within this region of the 5D hypersphere (which would include Lower, Upper and Intruder fluids) might have thicknesses that could also be measured in terms of this tiny length.

The overall production of vortices imposed by available shear for SDU photons would determine SDU light's constant for speed.

The limits on displacements of the adjacent 4D interfaces would determine SDU light's frequency and wavelength



Pulsations develop into photonic structure

Fig 60

Another consequence of the limit on 4space displacement (SDU h/2π) is that confined quantities of energy too large to be accommodated by single flexes of the interface generate pulsations or tiny fluctuations within the region of maximum allowed displacement (Fig 60). This would be similar to the "chatter" displayed in other systems subjected to overload. These pulsations quickly develop into full fledged photonic structures with very high frequency involving both 4D interfaces. The original quantity of energy is thereby parsed through multiple flexes. Thus SDU h/2π also indicates a specific quantity of energy or packet and in some cases this quantity could be used interchangeably with the constant. This energy and constant would also affect the other patterns of torque and shear such as SDU particles.

Another interpretation of the (SDU h/2π) length is that it reflects the average quantity of shear vortices when created by a specific intensity of shear.

The above describes only one of a number of polarized shear wave patterns within the SDU. Those that have intensity per unit volume too low to “bump” against the SDU Plank limit would not fragment to form SDU photons. These would be analogous to our radio waves or the fluctuations cause by uniform motion within orbitals.

SDU photon matter interaction

An Intruder$_L$ or $_U$ swarm has altered its orbital. It has moved from a higher to a lower energy orbital state. This creates a disruption within its intensified torque and it associated shear vortices. As torque escapes it becomes photonic in structure, changing its shape from that of a curved segment of a cylinder to a sheet like wave made up of continual rebounds. The picture here is that of a linear wave that has sheets of vortices with consistent orientation escaping up 4D interfaces as it moves through space, similar to a zipper coming unzipped. This SDU photon passes through the swarm and onto chaotic 3D interface.

It continues until it encounters another swarm. What happens next depends on the state of the swarm.

If the eye's motion is synchronous with the frequency of the photon, they combine, raising the eye and its swarm to a higher energy orbital or even forcing it to escape. If it is not synchronous, it continues through the swarm and subsequent non synchronous swarms until it intersects synchronicity or leaves the field of swarms. If it does combine with a swarm, that swarm could return to its base state emitting another photon of a different frequency. The path of an unabsorbed photon could be altered and decelerated by swarm fields of greater density. These substances would be transparent. Those substances whose SDU atoms consist of greater numbers of swarms are more likely to contain swarms that synchronize with many frequencies of photons. These substances would be opaque. Complex, Intruder$_L$ swarm configurations as in SDU carbon could also contain resonances that allow absorption of many frequencies of SDU light. They could then reemit it as other frequencies or heat. Substances that contain many freely mobile $Intruder_L$ swarms could absorb and then reemit SDU photons as reflections. These would be metals. In other words all of the interaction of $Intruder_L$ swarms and SDU light should mimic the interactions of electrons and light.

So, one should be able to distinguish one substance from another by the frequencies absorbed when “white light” passes through them.

SDU photons with lower frequencies could have insufficient energy to provide all of the vortices and energy for the jumps to force $Intruder_L$ swarms to change orbitals but could increase vortex numbers (mass) in one region of their orbital in such a manner as to nudge the swarms in one direction without actually changing orbitals. This would cause their cores to shift positions and follow. The cores would simply be responding to $Intruder_L$ swarm’s new steady pattern of torque in contrast to a pattern previously produced. In this way whole systems could receive SDU inertial mass or momentum.

Likewise if a system is forced to decelerate, the change in torque could be reflected by the same loss of vortices described above and subsequent creation of low frequency wave trains.

A very energetic SDU photon could occur during annihilation of $Intruder_L$ with $Intruder_U$ swarms. These resultant SDU photons should have sufficient energy in the form of vortex numbers to recreate $Intruder_L$ $Intruder_U$ swarm pairs under the right conditions. These photons could also be created and interact in other ways but this mode of annihilation and creation reflects this capacity. (Gal-Yam, Avishay, “Super Supernovae” Scientific American, June 2012, Vol306, Number6, pp 44-49)

It also suggests ways in which high energy photons could become swarms and the potential for extremely complex and messy interactions in which extra swarms are unexpected byproducts. This suggests how high energy SDU light could become SDU matter and vice versa. They are simply variations of a single theme. It is shear organization created by torque wakes, in sheets or in columns, that determines their properties.

Individual vortices or wave trains within Lower and Upper fluids at the 4D interfaces would be restricted in regards to their interactions. That is they would be unlikely to annihilate each other. This is because the Lower/Upper interface keeps them within their quadrants. There is no equivalent barrier between Intruder_{L} and $_{U}$ vortices. A SDU photon created by an Intruder_{L} swarm could interact with either Intruder_{L} or Intruder_{U} swarms. Whereas a SDU photon created by a Lower fluid swarm could react with Upper swarms only under special conditions. When Lower or Upper photons do interact with SDU matter they could engender individual swarms in their quadrants that might even undergo consistent forms of decay.

A very special SDU photon should be created when conglomerates fuse, decay or collide. It should involve both sides of the Intruder/Lower and Intruder/Upper 4D interfaces. This is because the swarms involved are rearranging their vortices on all sides of the interfaces. This raises the possibility of rotating wave trains around the 3D interface that react with SDU matter (when they react at all) as determined by the phase of their rotation. These would behave similar to neutrinos in our universe. For instance vortex concentration in the wave train could rotate:

With phases that occupy both sides of the Intruder/Upper 4D interface followed by phases occupying both sides of the Intruder/Lower 4D interface followed by phases on both Intruder 4D interfaces and then back to phases on both sides of the Intruder/Upper interface and so on.

They could not form vortices at the Lower/Upper interface because there is no shear there. Within this shear variation Lower and Upper fluids do not rub against each other.

These photonic structures would rotate on an axis parallel to their direction. The direction of the rotational sequence would be determined by the structure of the swarm conglomerate that was changed. One direction of rotation would be “anti” to the other. For instance when the SDU weak force creates an Intruder_{L} swarm, it also creates a SDU antineutrino. If it creates an Intruder_{U} swarm, it also creates a SDU neutrino.

(see “The redistribution of Energy across interfaces” and “The limitations imposed by available shear result in SDU weak force” below).

One of these photons would be seen as in one rotation while coming toward the viewer and anti after it passes.

This multi interfacial rotating SDU photons would seldom interact with swarms because the timing of their rotational phase would seldom be resonant with the swarms they encounter. However if they did interact, the byproducts would be determined by their phase.

If their phase was in Intruder $_L$ or $_U$ they might interact with Intruder$_L$ and/or Intruder$_U$ swarms. If their phase was at either the Lower or the Upper interface, they might interact with swarms at these interfaces.

Other SDU photons could also take on rotations. But these would occupy only one side of a single 4D interface. Regarding those that occur only on the Intruder interfaces, SDU birefringent materials and shallow reflections could isolate and “freeze” compatible orientations of rotating and nonrotating SDU photons. This SDU light could then be blocked or its orientation could be rotated by other SDU birefringent material.

SDU Universal Conservation of Energy is Conservation of Torque

Within the SDU universe “conservation of energy” is actually conservation of the torque applied to the adjacent 4D interfaces which is maintained by shear vortices. This torque is transferred between SDU universal objects by SDU photonic structures, polarized shear and direct contacts that change the motions of objects.

The redistribution of Energy across interfaces

Below I suggest some of the reconfigurations of swarms that could occur in unstable SDU atoms and violent interactions. These reconfigurations can result in the loss of bound swarms and the creation of others, at times in unexpected places.

There is always some polarized shear on all sides of a 3D interface surrounded by torque. It is just more intense on the side(s) with established swarm cylinders. If for some reason cylinders become detached, the torque does not simply go away. New swarms and SDU photons can be created on the same or adjacent sides. New swarm conglomerates could even form if the residual torque is sufficiently intense. This way an unstable large swarm conglomerate could decay and in the process produce an extra Intruder$_U$ swarm (SDU positron). This would an example of common torque reestablishing energy around the 3D interface.

If there is sufficient energy and if for some reason swarms are lost on one side of the 3D interface, shear could initiate new swarm columns on any empty 3D quadrant. The loss of swarms could be caused by unstable configurations or collisions.

The very presence of large conglomerates with high mass from their many swarms blunts the advancing 3D interface. This and the extremely high energy torque should increase the probability of energy rearrangement among interfaces. Vortices that are lost on one side of the interface are replaced by vortices on other sides. This could also be enhanced by SDU photonic activity between member swarms.

This also suggests the possibilities of "anti" configurations.

The Trio$_U$ swarm configuration with Intruder$_L$ swarms sharing their common torque is the predominant Trio configuration in the SDU universe because of the "advancing bubble" (see above) shape of Intruder. This does not eliminate the possibility of stable Trio$_L$ configurations associated with Intruder$_U$ swarms. It just makes them unlikely. But as suggested above large conglomerations could "blunt" this advancing bubble effect.

One of the ways "anti" configurations could be created could be if during a violent event, a

Intruder$_U$ swarm was detached from a Trio$_U$ and the extreme common torque still present created a new Intruder$_L$ swarm on the Intruder$_L$ side of the 3D interface. The new Trio$_L$ would be the “anti” configuration to the original Trio$_U$. If it should contact another Trio$_U$, the Intruder$_L$ (SDU electrons) / Intruder$_U$ (SDU positron) interaction would annihilate them.

The limitations imposed by available shear result in SDU weak and SDU strong configurations.

Shear caused by the motion of Intruder against Upper and Lower fluids is the same everywhere. This causes the support for shear to be uniform throughout the 3 and 4D interfaces. This also suggests that swarm conglomerates would distribute this available shear fairly evenly among the individual swarms. That is a trio would have its shear and torque fairly evenly distributed among its three swarms and a quartet among it four swarms. However a quartet might have only slightly more mass because four swarms would push the shear and torque to intensities that could barely be supported by available shear. This would make trios (SDU protons) more stable than quartets (SDU neutrons)

The only way swarms can experience increased shear is by traveling over fresh interface. This motion allows torque that is greater than that which would be supported by the background alone. If they stop or slow down the higher torque must be dissipated to adjust for the lower shear. The swarm’s internal SDU photons coming from the side opposite its primary torque can not seed new vortices in the primary torque region because there is insufficient shear to support them. They pass through the system and out onto unsaturated interface. This loss of energy forces complex swarms to reconfigure and the nearby background shear to create new swarms and/or photonic structures.

Ways in which this can happen:

1. The unstable swarm could fragment and give up resonant swarms that had been allowed

by the lost torque. I will call this the **SDU weak reconfiguration**.

2. Share torque with a swarm that is pressing hard against it in such a way that both swarms share a region of common torque as described above. In this configuration they need fewer vortices and can be both supported by the available shear. I will call this the **SDU strong reconfiguration.** The lowered torque is also equal to less SDU mass so the combined swarms have less SDU mass than when they were separate. It would take enormous amounts of energy to separate these two swarms so lower numbers of vortices linked in this manner are very stable.

However there may be a limit as to how many swarms could link together in this. Once the limit is reached an additional swarm could still become caught within a well but it would not form a link with the swarms below it. It would be the first of a new linked layer. It would still be held within the well because it has the same 3D presentation and is traveling in the same direction so it moves as close as possible to the lower swarms.

The earlier interactions should be exothermic because the energy of their combining exceeds the original energy required to push the swarms together. The later interaction should be endothermic because there is no loss of energy by the new swarm. If additional swarms were captured, their linkage would be exothermic.

As swarms accumulate in this way they could become unstable because of the limited available background shear and/or irregularities in the shapes of the gravitational wells. It is possible that if conditions are right they could break up or rearrange through combinations of the SDU strong and the SDU weak interactions.

This could occur through several pathways:

The capture of Intruder_L swarms by the core,

the escape of entire configurations from the core to form smaller conglomerates, freed fragments from the disruption of conglomerates that create multiple swarms such as new Intruder$_L$ and Intruder$_U$ swarms

This last while being a relatively rare event would not be forbidden. It would actually involve the conversion of energy into new SDU matter. This new SDU matter would most likely be in the form of free Intruder$_L$ or Intruder$_U$ swarms because they involve only one side of the 3D interface

We could use the SDU strong reconfiguration to build SDU universal elemental units (SDU nuclei) using combinations of Trio$_U$ and Quartet swarms.

These SDU nuclei would have complex gravitational wells with complex regions of SDU gravitational overlap for any associated Intruder$_L$ swarms. These regions when unfilled with would be indefinite in shape. But as they are filled by these Intruder$_L$ swarms they would take on configuration allowed by stacking and interference patterns. Those regions of SDU gravitational overlap that are partially filled will take on an appropriate shape to allow irregular indefinite stacking. That is, this stacking of the Intruder$_L$ swarms will be symmetrical but mobile in that they will be constantly changing or being rearranged. This motion will be resonant with the motion of the Trio$_U$ core swarms at the bottom of the gravitational well. Call the combined structures of SDU nuclei and Intruder$_L$ swarms "SDU atoms" Those SDU atoms with equal numbers of Trio$_U$ intensifieds and Intruder$_L$ swarms will have no predominant Lower or Upper torque (neutral charge). That is the space around them will have the same intensity of torque waves from each species.

Mobile peripheral Intruder$_L$ swarms of one atom should be able to interact with peripheral Intruder$_L$ swarms of other SDU atoms. In fact they could leave their SDU atom to enter the virtual well of another SDU atom with the space completing an outer shell. This would create SDU atoms with predominant Lower or Upper torque (negative or positive charge). Call these SDU ions.

SDU Intruder$_L$ swarms (SDU electrons) could also share bonds with peripheral SDU Intruder$_L$

swarms with opposite spin on other atoms forming SDU covalent bonds.

Intruder$_L$ (SDU electron) capture

In the section entitled “Some Imagined Structures” a pattern was suggested in which Trio$_U$ swarms could be combined with Quartets. This structure would be more stable than then a combination of two Trio$_U$ swarms because a Trio$_U$ /Quartet combination is connected or enmeshed on all four sides of the Lower/Intruder and Upper/Intruder interfaces. Two connected Trio swarms are anchored only on three sides. This suggests the idea that conglomerates are more stable if that have an ideal proportions of Trio swarms to Quartets which in turn raises the question as to how Quartets might be created.

Imagine a situation in which Trio$_U$ and Intruder$_L$ swarms are subjected to extreme heat and pressure, as in a SDU star. If two Trio$_U$ swarm contact each other they might not have the ability to form a three sided anchor. But if an Intruder$_L$ swarm receives sufficient energy from the pressure and heat to penetrate into the well shared by the two Trio$_U$ swarms into a region that is substantially below the selective horizon it might start to share their common torque pattern and resonate between them. This new combination is now anchored on all sides and is much more stable. In the process the Intruder$_L$ swarm must desert its original torque pattern which is also the source of its mass. The ever present background shear confiscates this torque creating new swarms and SDU photonic structures which escape. Once this happens the Intruder$_L$ swarm is trapped because there is no torque outside the new structure sufficient to support it.

One SDU photonic structure likely to be produced is a SDU neutrino (or anti) described above. It would first have a form that could be associated Intruder$_L$ but after traveling some distance would rotate and transform reflecting characteristics and possibly interactions of the other fluids and then transforming again back through Intruder and so on. I say “possible” interactions because its interaction with another object must coincide with the correct phase of its transformation and this is unlikely.

SDU Black Holes

Considering the forgoing, it seem likely that there could be accumulations of swarm conglomerates of mass high enough and their associated indentations to form SDU stars , neutron stars and black holes. The indentations would still be shallow but the virtual wells would be progressively intense. The speed of the Intruder is faster than the speed of SDU light.

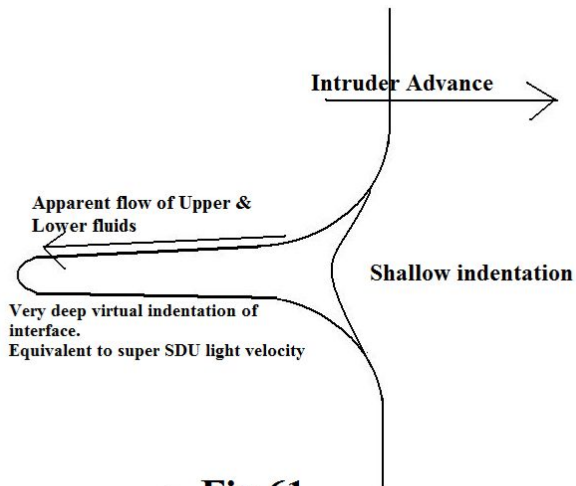


Fig 61

If the contours of 3D interface should take on vectors approaching to the direction of Intruder's expansion any energy traveling along these contours must move against the apparent backflow of Lower and Upper fluids (Fig. 61).

If this apparent flow is greater than SDU light's speed, it could not escape this flow and would forever be swimming upstream.

I'm suggesting that these deeper indentations would not allow any SDU matter, light or other components of the SDU universe to escape from them and they would behave in much the same way as our black holes.

Time and Contraction

Every thing in the SDU must adhere to the speed of wave propagation allowed by the sheared 3D interface. This includes the waves of polarized shear, SDU light and SDU matter. This limit determines both forms of spin of SDU matter. That is intrinsic spin will have a specific speed and orbital spin will have a specific speed.

I want to concentrate on orbital speed. Every swarm and swarm conglomerate should adhere to specific orbital speed. This could be influenced by its structure. That is orbital speeds of single swarms might be slightly different from Trios or Quartets. Large conglomerates could complicate things further. But the speed within each should be constant. If the swarm is not moving, this speed would be the distance traveled as a swarm makes revolutions of its orbital in a unit of time, if the orbital path of the swarm was stretched out into a straight line. It would be the speed along this line that is constant. So if a swarm rotates in place or is static, the number of orbital rotations is constant for an orbital of that size. Orbital that are larger would exhibit fewer revolutions and orbit that are smaller would have more revolutions but the "straight line distance would be the same. However if the swarm is moving, the distance traveled per unit of time must be removed from the number of orbital transits per unit of time. An extreme case would be that of a swarm moving at the permissible speed of propagation. In this case it would make no orbital transits. The rule seems to be that fewer orbital transits per unit time are produced, as a swarm's speed across the 3D interface increases. If we view orbital revolutions as the ticks of a clock, this clock should slow down as the speed of a swarm and all its associated structures increases.

Much of the discussion above suggests that it is orbital revolutions that determine the various wavelengths and frequencies associated with swarms. If a swarm produces fewer orbital transits per unit time it will have a lower frequency. If all of the structures within a system operate with compatible wavelengths, as that system accelerates all wavelengths arising from orbital rotation should increase and all frequencies should become lower. This could very well slow down the activity between structures.

Contraction should occur when indentations changes shape to match the shapes of orbitals. Static swarm should have orbital revolutions that occupy all permissible planes at the interface. The first change in an orbital as a swarm accelerates is that it spends more and more time in orbital planes perpendicular to the direction of shift. This would be because its intensified torque must face the direction of motion. It is the positions of the planes of a swarm's orbital revolutions that determine whether it a disk or a sphere. If the revolutions are primarily in planes that are perpendicular to each other the indentation is spherical. As planes of rotation become more and more parallel, the indentation becomes oblate and finally a disk flattened in a plane perpendicular to the direction of acceleration.

The End

Everything within the SDU universe is derived from the advance of the Intruder. This includes the vortices and swarms with their application of torque and drag on the advancing 3D interface. If one considers the advancing Intruder to similar to our "dark energy" then SDU gravity is not an opposing force but is derived from it and could not exist without it. So I see the end of the SDU in several forms.

One is a situation in which the reservoir of the Intruding fluid is depleted and the advance of the Intruding fluid slows to a stop. Here there is no shear. Vortex formation ceases, remaining vortices and torque escape up the adjacent 4D interfaces and the 3D interface becomes perfectly uniform. Even SDU light and other radiation can not continue because they are dependent on the formation of polarized shear which no longer is present. SDU matter is gone for similar reasons. The whole SDU universe becomes simply a flat humongous inactive bubble. There would be no events to compare with each other, no waves, no interaction and as far as the SDU is concerned no time. This strongly suggests that within a static SDU at least that time can not be equated with space when space is described as interfacial.

There is apparently no situation in which SDU dark energy can simply overcome SDU gravity because both originate from the intrusive advance of the Intruder. There will always be SDU dark energy as long as the Intruder advances. There will always be SDU gravity as long as this advance produces shear. However if for any reason there is no longer any shear, then vortices and their associated indentations would disappear.

It is unlikely that the Intruder's intrusion should remain uniform everywhere as the 3D interface grows. Therefore it is to be expected that eventually there would be regions that at first lag behind the general advance and then develop huge macro indentations in which the backflow of Upper and Lower fluids begin to push objects along the 3D interface towards their centers. This effect would be similar to what is seen as the “great attractor” in our universe. These macro indentations could become virtual wells as the SDU universe ages and as the disparity increases between them and the rest of the SDU universe. (Update August 17, 2017: The concept of The Dipole Repeller as reported by Yehuda Hoffman, Daniel Pomarède, R. Brent Tully, and Hélène Courtois, Nature Astronomy 1, 0036 (2017) is consistent with there being portions of the SDU 3D interface advancing ahead of others , that create general slopes relative to the horizontal perpendicular to the direction of its advance. This would cause galaxies to shift from or be repelled by the "high" regions towards "low" regions. This is not the only explanation of the phenomenon but still, it is consistent with the paradigm of a SDU).

This raises the possibility that what was originally a uniform circumference could become fingerlike projections with portions of the SDU becoming separated from each other. If any of these projections should become separated from the general intrusion they would cease to expand. In this case they would no longer produce shear and all of the structures allowed by shear would cease to exist. The vortices and torque associated with them would escape along the connecting 4D interfaces. There would be no SDU gravity. They also would become smaller but still humongous static inactive bubbles.

Another possibility of demise is if the Intruder encompasses the whole 5D hyper sphere. In this situation the interface would begin to shrink as it passes the circumference of the mother hyper sphere. Its collapse is not due to gravity but the geometry of the situation. As it approaches and passes the mother's circumference, the forces that generate shear might actually decrease and ultimately reverse, destroying all structures dependant upon the original shear. The new shear in the opposite direction may not be sufficiently intense to establish new structures. The SDU universe becomes filled with increasingly chaotic shear that escape up the connecting 4D interfaces as it shrinks to nonexistence on the other side.

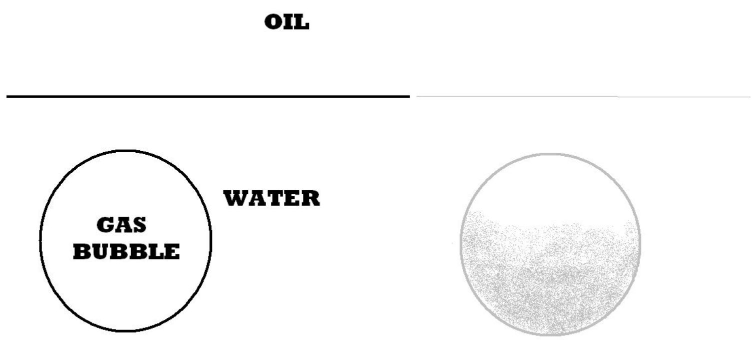
Other speculators may find other scenarios. I would be pleased if they found inconsistencies and created their own versions of the paradigm.

Appendix A

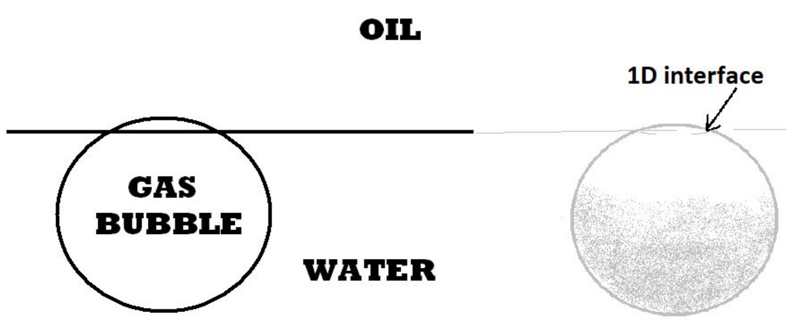
Some Additional Thoughts about Spatial Dimensions as Interfaces

The Creation and Destruction of Spatial Interfaces

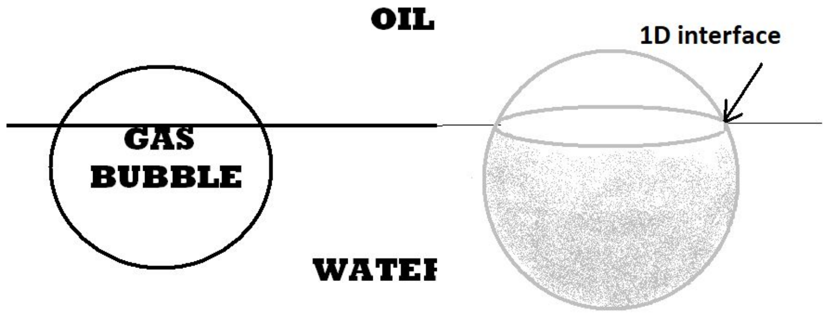
Spatial interfaces are created and destroyed so often that we seldom take notice. For example we see bubbles rising and breaking the surface of liquids all the time. But we seldom observe the spatial relationships present. Specifically we don't usually observe the creation and destruction of the linear or 1D interface as the bubble passes through the plane or 2D interface.
Allow a bubble to rise through water layered under oil.



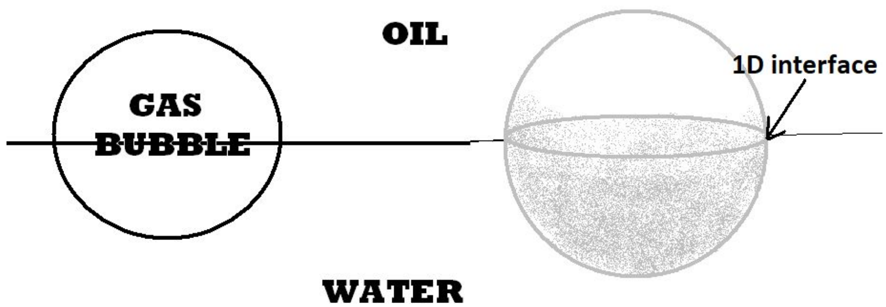
As it starts to pass through the 2D interface a small 1D interface is formed between oil, water and the gas within the bubble.



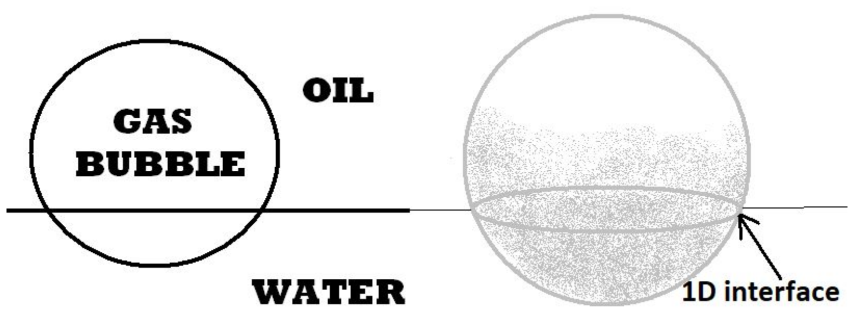
This interface becomes more apparent as the bubble passes through the plane formed by oil and water,

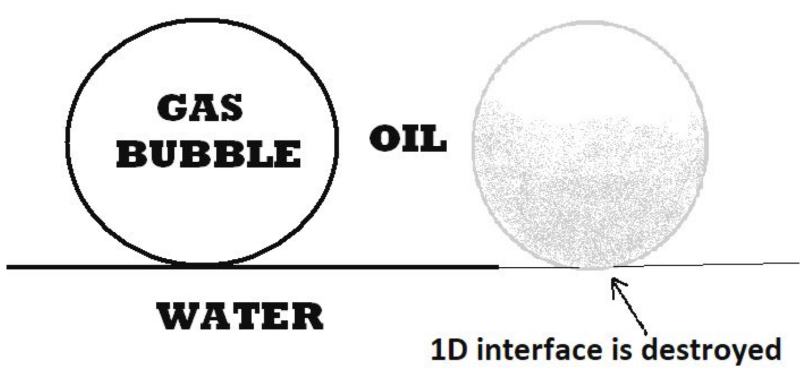


The interface eventually has the same diameter as the bubble.

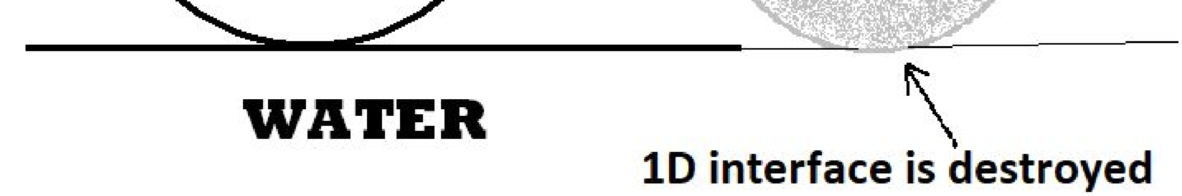


As the bubble continues to rise the 1D interface shrinks in size.

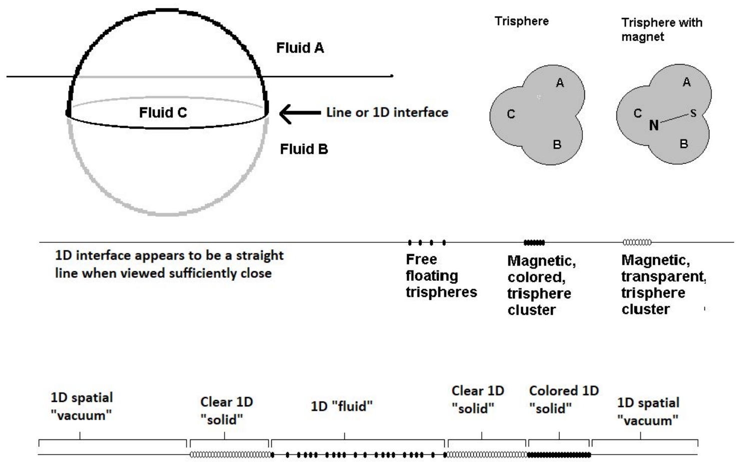




As the bubble passes through the oil-water plane the 1D interface is destroyed.

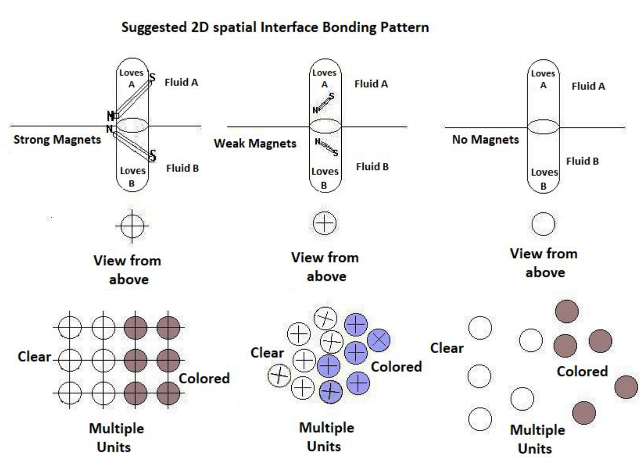


Higher Dimensional Objects Confined to Lower Dimensional interfaces



Imagine a situation where fluids "A", "B" and "C" are not miscible with each other such as would be seen with oil and water (see diagram below). Fluid "A" is layered over fluid "B". Fluid "C" is introduced as a bubble that doesn't mix with either fluid "A" or "B". Allow fluid "C" to have a density such that it stays at the interface between the other two fluids. Half of this bubble is in "A", half is in "B". There would be a line or 1D spatial interface at the intersection of the three fluids.

Add to this some small objects that consist of three dissimilar balls glued together. One ball is attracted to "A", one is attracted to "B" and the third attracted to "C". Let's call them "trispheres". Place them within the interface formed by fluids A","B" and "C". Their attractive characteristics should keep them at the 1D interface. In this way they are held in place on the line and they have one degree of freedom along this line. If there was no particular attraction between these "trispheres" they would eventually just become dispersed around the bubble. If these" trispheres" repelled each other they would be analogous to a gas. If they had weak attraction for each other, they would be analogous to a liquid. Let's add some stronger forces to other "trispheres ". Add groups that have tiny magnets in which the north pole is to the left along the line and the south pole is to the right. They should be attracted to each other and form linear clusters. These clusters could be viewed as analogous to solids in 3D space in that they must always move as a group. There are point (0D) spatial interfaces between these “solid” clusters and the “empty” or vacuum 1D interface outside of them. Add clusters that have other characteristics such as transparency and color. Swing one cluster around the bubble so that all of the free floating "trispheres" are contained between two clusters. The space outside of the clusters without "trispheres" could be viewed as analogous to a vacuum in 3D space. The trispheres are 3D objects confined to a 1D interface



Imagine a situation in which there is a thick layer of oil floating on water. The interface between oil and water would be a plane (or 2D spatial interface). Add to this, nano rods that are attracted to water on one end and to oil on the other, similar to phospholipids of cellular membranes in our universe. The rods would tend to collect at the planar interface and stay there. They could move freely along the plane but they would have difficulty moving above or below it. Add magnets to some of the rods in such a way that they can form clusters. Allow some of these clusters to be inflexible. That is every unit maintains its position relative to the units around it. Shield the magnet on some clusters in such a way that they have a flexible attraction to each other. That is, units although attracted to each other will shift freely within the cluster. Now make some clusters colored and others transparent.

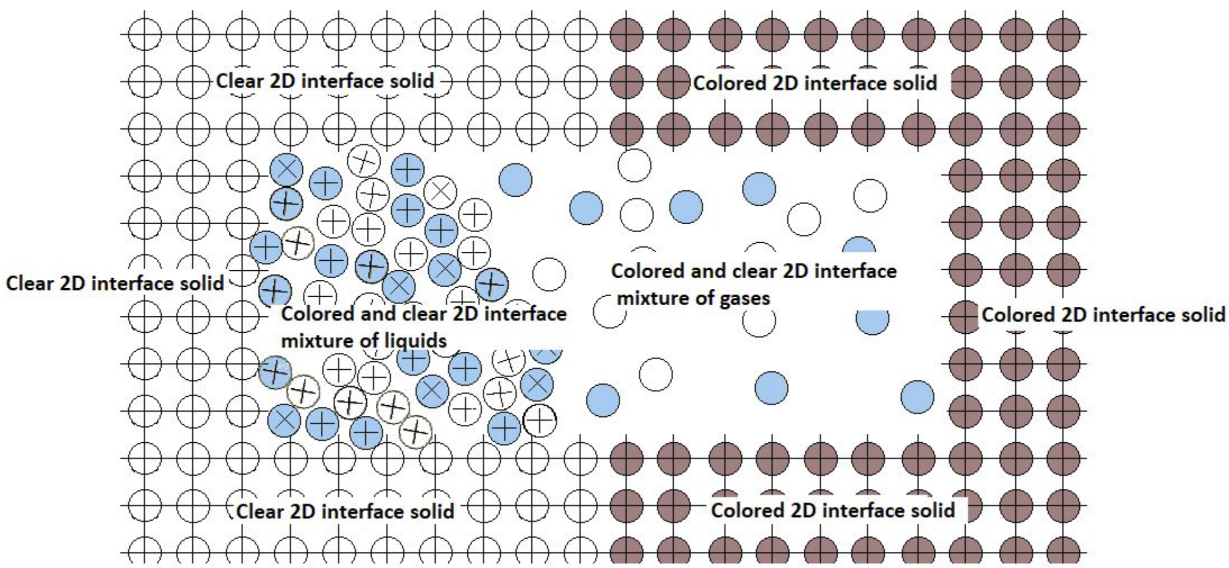
Call the rods without magnets, "2D gas". Call the rods that move freely within their clusters, "2D liquid". Call the rods that are bound inflexibly, "2D solid". Call those areas of the plane between water and oil where there are no rods, "2D vacuum".

Assemble these rods to form the following objects.

A very thick ring of "2D solid", half colored, half clear.

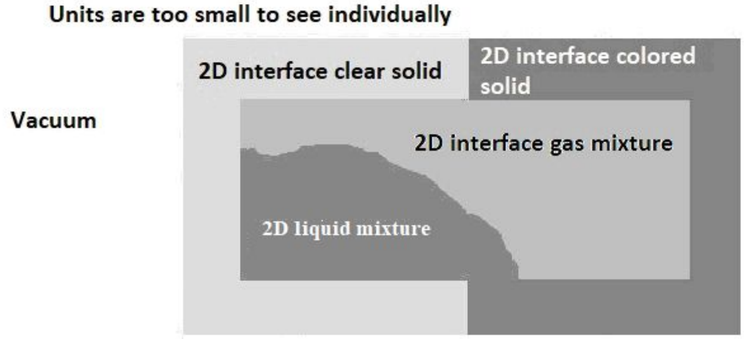
Fill the interior with "2D gas" and a blob of "2D liquid".

Diagram of the units on the 2D spatial interface and their bonding in the different areas of the next illustration



Move above and away from this assemblage until you can no longer see the individual units but only the objects they create.

Units are too small to see individually



Paraphrase:

There are linear interfaces (1D interfaces) on this plane where the quality of the plane (2D interfaces) changes from empty (vacuum) to cluster (solid).

There are points on this plane where the quality of a line (1D interface) changes from transparent solid and vacuum to colored solid and vacuum.

There are linear interfaces on this plane where the spatial quality changes from cluster (transparent or colored) to free moving (or gas).

And there are linear interfaces on this plane where spatial quality changes from gas to liquid.

These are 3D objects confined to a 2D interface.

I have not covered all spatial relationships but within the SDU, lower dimensional interfaces would be associated with higher dimensional interfaces and **5D objects would be confined to a 3D interface**.