

Visualisation of Complex Time

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The influence of charges acting inward from the past and outward into the future, at the velocity of light, may be the entire sum of forces which act upon us and which we enact upon the universe. It is speculated here that recent acceptance of action at a distance (maybe better described as action over a spacetime separation, which reveals its relative nature) requires us to reconsider these forces as the origin of both gravity and inertia by accepting the necessity of complex time. Maybe we can resolve the mechanism of this action as being the divergence of spacetime.

The consequence of action at a distance

We are living on the Earth and all share, to a close approximation, our progress through time, what the study of relativity designates as our own proper time. Special relativity shows the relative progress of time to vary with relative velocity to the point where electromagnetic radiation propagates instantaneously in its own proper time despite the separation in our time between our observation of its emission and of its absorption. In the light of experimental evidence supporting action at a distance we should now attempt to visualise the consequence of this reality.

A dynamic structure which incorporates all physical realities requires a complex description such as general relativity, but general relativity does not, for most of us, lend itself to visualisation and it does not lead us to an inevitable seamless logic, as is demonstrated by the conclusions drawn from it which require us to imagine interaction between matter and empty space. Maybe we can begin with what we know from a minimum of assumptions and find clues to the common origin of gravity, inertia and electromagnetism. We know that electromagnetic influence is fundamental and if we can understand the duality inherent in the action of a single quantum, between what we observe and its own instantaneous action in its own proper time, then we can merge the two and work toward a more complete perspective.

The instantaneous action of emission with absorption requires an impossible visualisation where interacting matter occupies the same location in spacetime, impossible only until we include our own perspective which we can combine with that immediate action while its emission and absorption are separate in our proper time. What we then have is separate frames for progress of

time which seem contradictory but are both the direct consequence of special relativity. It was not a good assumption that the universe should be seamless from our perspective, our perspective is incomplete due to our singular progress through our own proper time and due to our existence at a single location, in the same way that the perspective of a quantum does not include our proper time the way that we see it. Our perspective is the source of much confusion and some apparent paradox, forced solutions to that paradox being a serious distraction. If interaction with our mass is immediate in its own frame then its action is also immediate to us.

Interconnection

What we see when we bring these known frames together is the same thing we already observe, a universe of separation between matter in all directions, but we gain a vital perspective upon time itself. Our observation of distant stars can now be understood as the observation of a single instant of our own proper time within which there is an immediate connection with what our previous narrow interpretation of time, our own proper time alone, could not show us, and that is the direct influence that the matter of the universe separate from us at the velocity of light has upon us from what we have interpreted as the past, and the direct influence that we have upon the matter of the universe separate from us at the velocity of light in what we have interpreted as the future, all coincident with our observation.

Knowing that the force of electrical action diminishes with the inverse square of separation, and assuming that the amount of matter we interact with increases with the square of the separation (in a universe of approximately even density on large scales) requires us to acknowledge an accumulation of the two which we have an almost neutral balance amongst. The immediate connection between us and those parts of the wider universe that we are inevitably interacting with because it is separate from us by the velocity of light, then looks like a sensible, maybe even an undeniable origin for inertia. Having that origin for inertia we must also accept that gravity is inevitably the result of the same set of relationships, the presence of local matter having greater influence for geometric reasons. What we need to bring this all together is a mathematical analysis which may show these interactions to be equal to the gravity and inertia we experience.

There are difficulties finding in this a seamless theory, not only the natural objections of incompleteness and redundancy but also a strange and unexpected requirement, when we bring these perspectives together we are required to accept the continuity of electrical influence between all charges which in turn requires us to separate the discreet action of quanta from the continuous advanced and retarded electrical action which occurs between all charges. This is where the incompatibility between quantum mechanics and general relativity may exist, maybe it can be solved by a more inclusive visualisation and analysis.

Assumptions

The assumption is that all action is the consequence of electrical force acting at a distance, which is the only feasible conclusion we can draw from the results of recent work done to resolve Bell's inequality. Action at a distance has a simple solution in complex time where the emission and absorption of a quantum are together a single event. Emission and absorption are only separate from narrow external perspectives and their wave functions are resolved at emission as acting at absorption which excludes any necessity for wave function collapse or multiple universes, the mystery to us resides in the relative rates of proper time between emitter and absorber including the red shift apparent at absorption. What we do know is that the tiny distortions of spacetime which cause relative acceleration of the location of masses, occur due to the presence of overwhelmingly large amounts of mass. The forces we are trying to resolve are not on the same scale as the divergences from flatness of spacetime which may be their mechanism of action.

It is assumed that these arguments are digestible without expansive mathematical analysis because to attempt that feat would mire them in endless almost incomprehensible detail most of which has already been resolved but for the conclusions we draw from it. It was always fair to assume that a mathematical resolution between general relativity and quantum mechanics would eventually come at the expense of some of the assumptions they are based upon, their rigour cannot be doubted but the conclusions we have drawn may no longer be acceptable following the proof of action at a distance.

Another assumption made here is the unequal distribution of opposite charges within atoms, positive charges being gathered in the nuclei and negative charges surrounding them at considerable separation, this indicates an uneven interaction between all molecules of matter which despite prior argument must continue in some small fraction to the far reaches of the universe. This will be the hardest assumption here made to resolve because the balance of attractive and repulsive forces is so close to neutral as well as long assumed to be negligible over separations greater than a few millimetres. What will decide this argument is the sum of all interactions and that comes into stark relevance in the light of complex time. Much work remains to resolve this assumption which has yet to clearly indicate an attractive or repulsive sum.

What can we learn from complex time

Apart from reinforcement of the knowledge that all of our assumptions are eventually called into question, we have learned an important lesson in the inseparability of local and universal events. We have learned that general relativity, which is a mathematical method for resolving the relationship between masses located separately in spacetime, must if it is true to special relativity, allow that points separated by the velocity of light are coincident from the perspective of the quanta

and or electrical influences that are acting between them.

It is hoped that a conclusion can be drawn from the above which accepts the concurrence of the entire universe as we look out at it. There is nothing special about our physical perspective but that it is personal to us, it is one of countless perspectives which are true relativistically. Perhaps the most vital conclusion we can draw is that we are immediately connected with the wider universe, which allows a mechanism by which we may one day gain acceleration relative to it for the purpose of travelling more freely in space.

Maybe space itself is a product of our perspective but be that as it may, there is no escape from the reality of separation between us and any desired location we may wish to reach within or outside of our solar system. If we can by some technique concentrate a directional equal and opposite reaction against the remote universe then we may be able to travel with the continuous acceleration required to reach the velocities which could make such journeys possible. Notions of how this may be done are forming (see emdrive.com).

Clarifying perspectives

Many authors discuss action at a distance in terms of interactions travelling faster than the speed of light. Electrical influence has velocity when observed from a material point but the geometry presented to us by special and general relativity preclude any influence which exceeds the velocity of light, by geometry, because that velocity is clearly relative. The gestalt arises when relating a traverse from a singular reduced frame which fails to incorporate the reality of other equally valid frames in which the separation between emission and absorption may or may not be coincident in spacetime. It cannot be stated strongly enough that the notion 'faster than light' is incompatible with both relativity and with quantum mechanics in our current understanding.

The proof of action at a distance may be a turning point in the development of the natural sciences which should not be underestimated, Relativity theory is now 120 years old yet stands unbroken by every effort of criticism since. The beauty of relativity is that it gives us a functional mathematical basis with which to interpret the universe around us and if theorists cannot accept it then they should propose something better. Relativity gives us a base but its proponents do not claim that its consequence is beyond interpretation. Action at a distance fits well with the math of relativity if we can accept that our singular perspective, which is locked to our inevitable progress through our own proper time and narrowed to our single point of observation, is incomplete.

To complete our perspective we need to accept the history and future of the universe as inseparable aspects of our present physical reality. The diversity of interpretations of relativity is the result of the scientific method even when it leads to consideration of notions like the 'block universe' which contradict our personal experience. We are not finished refining our interpretation

of relativity.

This discussion is an attempt to see a simplifying logic revealed by both action at a distance and complex time but it requires an unaccustomed broadening of our usual internal visualisation. If these notions are flawed then we can abandon them with ease but if they have relevance then we should consider all the results of experiments in both relativity and quantum mechanics in its light.

Conclusion

Relativity reveals to us the shape of relative time and suggests distortion of spacetime to account for gravity but gravity and inertia are two aspects of the same set of linearly compounding interactions and cannot be considered separately. The sum of all electrical influence both advanced and retarded may account for both gravity and inertia if we can complete two vital tasks, first to solve the integral sum of electrical interaction between all charges (which is not an easy task because the electron electron repulsive forces require a sequential double integral) and second to determine if electrical interaction acts by the divergence of the rates of proper time across the zero separation between charges in the frame of the energy and momentum transferred between them.

Some sources of inspiration for these conclusions

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