Bosons and Fermions

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Abstract

The reason for there being two states with respect to *"spin"* is rooted in the four logic types (0, 1, 2, 3-logic). When there is a seemingly mysterious property of matter, we inevitably find a rational solution in 2-logic (the relativistic perspective) which is only at *"apparent variance"* with 3-logic (the Newtonian viewpoint) … both being logically viable. So, logic must adjudicate a solution resulting in the noncontradictory instantiation of both in the *"real world".*

3-logic is the commonly understood perspective that two objects exist relative to one another and to the backdrop of stars that act as the *"standard of reference"* for such things as rotation. That is, we know we are spinning if we can detect centrifugal force.

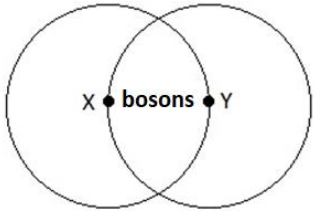
On the other hand, we have Mach's principle that is the 2-logic parameter … equally valid in the logical sense which relates the entire universe to the object spinning … eliminating the absolute Newtonian standard. Hence the appeal such a theory would have with Einstein whose fundamental theory of "relativity" is based firmly in 2-logic.

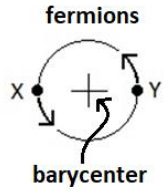
Special relativity is Galilean relativity with an asterisk* that denotes a logical modifier to restrict velocity to no more than the speed of light, i.e. no one may observe (or be) an object traveling faster than 'c' … (except an object traveling toward the observer which can have any *"apparent"* velocity greater than 'c', while the apparent *"away velocity"* is limited to ½ c).

Question: How does logic adjudicate an argument with itself?
Answer: It shows both sides under different circumstances if neither can be eliminated.

In 2-logic, each of two mutually rotating particles uses the other as its "*referent*". Thus, particle X sees itself as being at the center of the rotation with Y rotating around it … while particle Y also sees itself as at the center with X orbiting around it. These are "*bosons*".

In the foregoing, the distance between X and Y, is taken as 1 unit and the orbit length as 2π. The situation is purely "*relativistic*" meaning that there is no physical acknowledgement by X or Y of any absolute reference frame, i.e. the α-field (Newtonian absolute reference frame) has no part to play here.

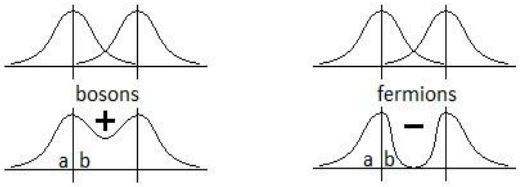




In 3-logic, both X and Y exist relative to the α-field and acknowledge that relationship by orbiting around a common barycenter.

The distance between the X and Y is still 1, but the distance from the barycenter is ½, so that the orbital distance is half that of the former bosons. "*Fermions*" must go twice the distance to complete an orbit equal to bosons. Fermions can then be defined as *spin ½* particles and bosons are *spin 1*. Both points of view are logically valid. One is valid in 2-logic, and the other is valid in 3-logic.

In statistics, we may say that the probability of the position of a particle about its "*locus*" is given by a Gaussian distribution. When two proximate particles are fermions, the overlapping Gaussian distributions are subtracted, installing the barycenter as the referent (the α-field) in 3-logic. Therefore, they are repelled by the lesser Gaussian area shown in the illustration marked 'fermions' (area *a* > area *b*).



When the two proximate particles are bosons, the overlapping distributions are added, creating a larger Gaussian area between them, thereby removing the α-field as referent in 2-logic. Bosons are therefore attractive (a < b).

This is a strictly logical proposition. In the deepest logical sense, there is no *"stuff"* that the universe is *"made of".* The universe may be thought of as the answer to the question …

"If there was some stuff, what would it look like
and yet also be internally logically consistent?"

The display we see and refer to as *"universe"* can be exceedingly mysterious but there is always a solution. All we can be certain of is that there can be no contradictions. We need simply do as Newton advised when asked how he made his discoveries … *"by always thinking on them".*

References

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