Update June 2023

As mentioned last quarter, work has continued on confirming how many fundamental energies or forces are required to produce the universe that we observe. The paper has been included here.

The paper considers the alternative interpretation that the background of partially and fully merged meon pairs may take an active role in producing what we interpret as charge by balancing the mass-only energy of an 'adjusted' meon dependent on its spin (twist) orientation.

For example, a left hand twist might produce a larger mass energy, in both positive and negative meons, whilst the right hand twist might produce a smaller mass energy. The larger or smaller change corresponding to the one-sixth charges that the main interpretation suggests is due to rubbing against the non-active background.

In a relativistic environment, it is possible in the active environment to produce all the observable outcomes of the non-active environment, but also to add that there may be an asymmetry at loop level, since the preferred meon twist orientation means a preferred loop spin orientation.

Depending on the definition used, it could mean negatively charged loops preferring spin LHS, photons preferring spin +1, and moving neutrinos preferring one spin rather than the other.

The main issue with the active environment is within quantum systems where the background is not present. Without the background, there is no way within tunnels to produce the effect of charge in stabilising loops.

It would also be the case that the partially merged meon pair chains linking directly between meons in loops, transmitting forces in the non-active background, would not be present and so not active.

The conclusion so far in the paper is that the active background hypothesis may be supportable in the relativistic environment but fails in the quantum mechanical environment. So a minimum of two fundamental energies or forces are required, with the others emergent from the structures formed.

However, work continues and it may be that further consideration comes to a different conclusion. This will be covered in future editions of the journal.

One additional aspect has emerged from the reinterpretation tried above which should be valid in the current hypothesis and the reinterpretation.

On the observable mass of the loops, which it might be expected would be directly related to the rotational frequency of the loop; there is an additional factor involved.

As a loop rotates, the meons passing a point in the background will be either LHS or RHS twist orientation. If the orientation of the next meon in the loop changes from LHS to RHS, or vice versa, the background receives a flip in its rubbing direction that is transmitted via the attached chains as a measure of the observable mass of the loop, worth one-sixth of the loop frequency.

The direction of the flip, RHS to LHS or LHS to RHS is immaterial, so that the observable mass of the loop is a fraction represented by the number of flips around the loop divided by the maximum six possible flip events for a three-pair loop. Where there is no flip between adjacent meons, there is no effect on the background and these events do not transmit the loop frequency as part of the observable mass of the loop.

This means that the electron and positron, both with six flips around their loops, will show 100% of their frequency as their mass.

For symmetric neutrinos, being either 'big' or 'small, type, there are no flips in either type, as they each have the same twisting orientation for each meon/anti-meon, and so no mass observable.

For asymmetric neutrinos, the observable mass depends on the twist orientation and meon position around the loop, giving different flip numbers for different isomers. Such a loop could show an observable mass of 1/3 or 2/3 of the loop frequency. This suggests that a mixture of neutrino types within each family could be responsible for the observed very small mass of 'neutrinos'. If the number of asymmetric neutrinos in a beam of symmetric neutrinos were very small, since they are unlikely to survive long in their asymmetric state, then this may be the case and could be proved by filtering out the asymmetric neutrinos in some way.

The up quark/anti-up quark will always have four flips and will therefore always show an observable mass of 2/3 its loop frequency.

The down quark/anti-down quarks have numerous isomers, all asymmetric and can show an observable mass of either 1/3 or 2/3 of their loop frequency, depending on the positions and twists of the meon/anti-meons in their loops. Again filtering may enable a split between the two mass isomer types.

Previously it was considered in the current hypothesis that it was the net charge on the loop that set the fractional observable mass effect, but it was not clear how that got transmitted to the background. By suggesting that it is the flipping of twist orientation between adjacent meons that affects the background, it is possible to ensure that the same fractional observable mass effect occurs for both a loop and its anti-loop, as well as producing a possible source of observable mass in neutrinos.

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19 May 2023