

Guilt by Association – Weak Higgs and More

sgm, 2018/DEC/14

The anthropic principle basically states that “we’re here; conditions must be right for us to exist” (implied: *all* things required for life to exist). Not a very satisfying explanation for *anything* considering science usually requires ‘some’ evidence to support a claim. Some is in quotes because we’re being sarcastic: usually a *tremendous amount* of evidence is required in science – either *disproving alternative* explanations or supporting yours – or *both*.

W & Z bosons are ‘guilty by association’ when it comes to explaining the weak force. We have *no actual proof* they *cause/mediate* the weak force; we simply prefer this explanation over the anthropic principle [as it applies here]: some nuclei are stable and some are not. The same basically applies to the Higgs: guilty by association as the mass-giver of W & Z particles.

There’s two more concepts we need before we can move on:

1. reductionism
2. essential/critical component idea

We use reductionism all the time: we break a process or thing into parts, try to understand the components, how they associate with each other, try to understand the big-picture or whole-system point-of-view, and see if we can reassemble the parts to recreate the original thing/process.

Sometimes we discover, while using reduction, a *critical* or *essential* component or sub-system. Examples are heart, brain, motor, or control-surfaces for an aircraft. Reductionism and critical-component analysis are *core* to science and engineering.

At the same time, there’s another relatively new notion called ‘emergent systems’ which deals with synergy / symbiosis / the whole is greater than the sum of parts. We

try to use emergent systems to explain things like consciousness because reductionism has failed so completely in the past regarding it. I personally don't believe fundamental physical attributes like mass and charge are emergent properties so we're going to leave this topic alone in this essay. It was mentioned for completeness.

Back to critical-component analysis: the idea is, *if we can isolate an essential component / sub-system of a thing/process, remove it, every time, does it completely destroy/disable* the overall system? So examples are again: heart, brain, motor, and control-surfaces for an aircraft. Everyone knows: you remove *any one* of those things and you're asking for trouble.

So let's apply this way of thinking about the Standard Model of elementary particles:

would radioactive decay happen *without* W & Z?

It's a very good question that is left to the reader to ponder.

I'm more interested in the question:

would gravitation happen without time-dilation?

According to standard General Relativity, *both* space *and* time curve near strongly gravitating masses. No time-dilation *alone* should not 'kill' gravitation in standard GR. However, if no time-dilation gravitationally also implies no time-dilation for Special Relativity, we may run into trouble. No time-dilation for SR implies no SR effects like Lorentz contraction and mass increase which means masses are not limited by the speed-of-light which could potentially violate causality. So eliminating time-dilation in standard GR could have some 'detrimental' universal consequences. In my GR framework, eliminating gravitational time-dilation would *eliminate* the force of gravity because in my framework, time-dilation is the *sole mediator*.

So if you asked a conventional elementary particle physicist: is radioactive decay *possible* without W & Z? Their answer would likely be "no". If you asked a standard GR physicist: is gravitation possible without time-

dilation? Their answer should be "there may be some problems".

A more interesting question for me is: what's the difference between matter and antimatter without time-dilation?

Conventionally, if there was no gravitational time-dilation, neutron stars would *not* slow time and antineutron stars should behave *exactly as* neutron stars: attract, destroy and mutually annihilate everywhere every-when. *We simply do not observe this.*

In my framework, if there was no gravitational time-dilation, there would be *no* gravitation and matter would have *no* reason to aggregate and form stars; *no* life; *nothing*. We obviously do not observe this (unless it's all some bad dream we're collectively having). [wink]

At this point in the history of science, convention is going the way of the anthropic principle with regard to antimatter: *something* happened to it – *why* we don't see 50/50. But my framework is better because it actually *provides an explanation*: it's *there*; we simply *don't recognize* it as such. Time-compression and gravitational repulsion explain the 'deficit'. Remember, a claim *without* tests/evidence is *not* part of science; antineutron star mergers should have *distinct signatures* as opposed to neutron star mergers especially those which end in black holes; antimatter black holes should evaporate extremely quickly in *every case* because the event-horizon is time-going-to-infinity (as opposed to time-stops for matter black holes).

LISA, a gravitational wave observatory in space – to be launched in 2034, should be able to *differentiate* between merger signature *types*. Baryon asymmetry, Dipole repeller, dark energy, and more are *easily* explainable within this framework. Time *will* tell.