Visible Planck Foam Violates Special Relativity

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https://youtu.be/szI-HpOScFQ&lc=UgxddUv-RhJwjat0J9J4AaABAg

A Comment on the SciShow (YouTube) post:
The Weight of "Nothing" Could Mean Everything (to Physics) (Aug 29, 2023)
https://youtu.be/szI-HpOScFQ

@drdca8263 said on 2023-08-31: *"But one can have a probability distribution over ways to decorate spacetime (e.g., scattering points throughout it) such that while any particular sample from it is, of course, not Lorentz invariant, the probability distribution over them is Lorentz invariant. So, I don't see why the vacuum state couldn't be Lorentz invariant even if it were described by a linear combination of things that were not."*

First — and this is important — there's no hiding of experimentally visible energy events across inertial frames. Suppose two inertial observers create energy distributions that look smooth in their spaces. In that case, both see the resulting linear combinations of those events, just as ambulance drivers traveling in opposite directions see each other's lights.

That means you get only *one* visible spacetime foam energy distribution, no matter how many inertial frames contributed to its creation. The question thus becomes whether you can design a distribution of visible non-zero foam 'sparkles' that look the same from all frames. A helpful image is to think of the sparkles as rainbow glitter scattered in space, with red indicating lower-energy speckles and blue higher-energy ones.

Pick a frame. To get the fully symmetric vacuum first observed by Michelson and Morley in 1887, the density of these speckles must be uniform, e.g., one speckle per cubic centimeter. There's more flexibility in choosing the color (heat) range, but let's assume a normal distribution that peaks in green and fades off in red and blue as a starting point.

Now switch to the view of Madison, who is cruising by at 0.6 c, which conveniently gives a Lorentz factor of precisely 2. The first problem is sparkle density along the x-axis: Madison sees *two* sparkles per centimeter, making her vacuum asymmetric. The second problem is color. For Madison, your entire spectrum of sparkle colors now appears in the ultraviolet, with your faintest red speckles falling just a tad beyond visible violet light.

The density problem has no easy fix since the Lorentz contraction is relentless.

The color problem sounds solvable by switching from a normal distribution that peaks in green to a smooth spectrum without any drops. However, this results in a variant of the ultraviolet catastrophe: *Everyone* gets incinerated by infinitely high frequencies at the top of such a featureless distribution.