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Ordinary matter and dark energy

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Abstract

In this microarticle, we suggest the application of Hawking radiation to ordinary particles. This is a thought experiment linking ordinary mass with dark energy.

keywords: matter, cosmology, dark energy, quantum gravity

Ordinary mass extracts negative mass from the quantum vacuum

1. Massive particles break the entanglement of spacetime [1].
2. After the entanglement is broken, the real particles from the ordinary matter attract (gravitationally) the virtual particles with positive mass.
3. The virtual particles with negative mass are repelled.
4. **Conjecture**: *dark energy is composed of particles with negative mass extracted from the quantum vacuum by ordinary particles.*
5. (4) is in accordance with the Davies-Fulling-Unruh effect (check [2] and the references therein).

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Some questions

6. How to prove (4) using pure mathematics?
7. What is the mathematical and physical principle underlying (1)?
8. What else breaks entanglement?

Some comments

9. There are pieces of experimental evidence about negative mass [3–5].
10. The relation between negative mass and dark energy is explained here [6].

Antigravitational waves

11. (1), (2) and (3) apply to ordinary matter and to black hole as well.
12. The conjecture (4) means that *negative mass* is propagating as *antigravitational waves*.
13. The **universe is expanding** by means of **negative mass, dark energy, or antigravitational waves**.

Final Remarks

If the conjecture is proved correct due to the Hawking radiation applied to the ordinary matter as well, then probably dark energy is the negative mass particles released from the quantum vacuum when ordinary matter breaks the quantum entanglement of spacetime.

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Ethical conduct of research

This original work was pre-registered under the OSF Preprints [7], please cite it accordingly [8]. This will ensure that researches are conducted with integrity and intellectual honesty at all times and by all means.

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