

[original idea]

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Gravity extracts virtual particles from the quantum vacuum (Davies-Fulling-Unruh effect)

Open Physics Collaboration^{*†}

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Abstract

This is a minimalist article exploring the relation between gravity and the extraction of virtual particles from the quantum vacuum in a heuristic fashion.

keywords: Davies-Fulling-Unruh effect, quantum vacuum, acceleration, quantum gravity

Gravity \leftrightarrow Virtual Particles

1. Uniform accelerated observers measure radiation from the quantum vacuum in a flat spacetime [1–5].
2. (1) means that *acceleration extracts virtual particles from the vacuum and transforms them in real particles*.

^{*}All authors with their affiliations appear at the end of this paper.

[†]Corresponding author: mplobo@uft.edu.br | Join the Open Physics Collaboration

3. From the general theory of relativity, there is an **equivalence** between **gravity** and **acceleration**.
4. (3) and (2), together, imply that **gravity can extract particles** (and energy [6]) **from the quantum vacuum**.
5. Inside a black hole, during its formation, probably (4) is being accomplished, which in turn influences black hole formation [7,8].
6. In a superconducting quantum interference device (SQUID), there are experimental evidence in this direction [9,10].

Final Remarks

The idea proposed here is to call attention to the fact that we might be able to extract the **zero-point energy** [11–13] by **manipulating gravity and spacetime**.

Open Invitation

Please *review* this article, *add* content, and *join* the **Open Physics Collaboration**.

Ethical conduct of research

This original work was pre-registered under the OSF Preprints [14], please cite it accordingly [15]. This will ensure that researches are conducted with integrity and intellectual honesty at all times and by all means.

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The Open Physics Collaboration

Matheus Pereira Lobo (lead author, mplobo@uft.edu.br)

Federal University of Tocantins (Brazil)