

The simplest imaginable solution to the cosmological constant problem

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If quantum vacuum fluctuations are virtual gravitational dipoles, the gravitational charge density of the quantum vacuum is obviously equal to zero. While very counterintuitive this is the most elegant and the simplest solution to the cosmological constant problem. It is intriguing that in spite of the fact that the total gravitational charge of the quantum vacuum is zero, the gravitational effects of the quantum vacuum may exist because of the gravitational polarization of the quantum vacuum by the immersed Standard Model Matter (i.e. matter composed from quarks and leptons interacting through the exchange of gauge bosons). We present indications that the effects of such a bipolar quantum vacuum may be in agreement with observations.

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