Abstract Submitted
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Casimir-type effects in QCD as a source of Dark Energy[1] EVAN THOMAS, University of British Columbia — I discuss a Casimir-like behaviour in the θ-dependent part of the energy in a "deformed" QCD. Defining the system on a manifold of size L, the energy takes the form $E = A\left[1 + \frac{B}{L} + \mathcal{O}(L^{-2})\right]$, despite the presence of a mass gap. In contrast, one would naively expect the form $E = A[1 + Be^{-mL}]$ originating from any physical massive degrees of freedom. I explain how this form comes instead from a non-dispersive "contact" term which does not originate from any propagating degrees of freedom, so that the naive argument is not applicable. I then present some explicit results in a "deformed" QCD, which while weakly coupled and under full theoretical control still exhibits interesting properties of true QCD such as confinement, a mass gap, and non-trivial θ-dependence. If the Dark Energy is defined as a mismatch between the energies of the system defined in a bounded system and in the Minkowski vacuum, then the discussed effect gives a Dark Energy estimated at $\Delta E \sim H\Lambda_{\rm QCD}^3 \sim (10^{-3}eV)^4$, which is astonishingly close to the observed value.

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