

Dark Energy from topology change at the foam level

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We investigate the invariability of the Gauss-Bonnet action term in 4D in the case where gravitational instantons appear in the quantum foam level. The key hypotheses of Euclidean Quantum Gravity, that produce instanton solutions of distinct topology, are encapsulated effectively into the quantum field fluctuations. Therefore, under the Effective Topological Variation Conjecture (ETVC) the variation of the Gauss-Bonnet term need not be zero and in the semiclassical approach yields a novel effective dark energy sector of topological origin. The effective cosmological constant

$\rho_{eff}\Lambda_{eff}$ is interpreted as the density of wormholes thus exhibiting a dynamical nature. We examine the case of Nariai instantons and Euclidean Wormholes leading to arbitrary sign of dark energy. The theoretical values of Λ_{eff} support our models candidacy for explaining the late time acceleration.

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