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A Minimal Length Uncertainty Approach to Cosmological Constant Problem

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Based on quantum mechanical framework for the minimal length uncertainty, we demonstrate that the generalized uncertainty principle (GUP) parameter - on one hand - could be best constrained by recent gravitational waves observations, and - on other hand - suggest modified dispersion relations (MDRs) to calculate the difference between the group velocity of gravitons and that of photons. Utilizing features of the UV/IR correspondence and the obvious similarities between GUP (including non-gravitating and gravitating impacts on Heisenberg uncertainty principle) and the discrepancy between the theoretical and the observed cosmological constant (apparently manifesting gravitational influences on the vacuum energy density), we suggest a possible solution for the cosmological constant problem.

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