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Inflatinary Cosmology as a Precision Test of Quantum Mechanics

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Inflation predicts that quantum fluctuations determine the large scale structure of the Universe. This raises the striking possibility that quantum mechanics, developed to describe nature at short distances, can be tested by studying nature at its most immense – cosmology. By fully accepting the inflationary paradigm we realize this possibility. A nonlinear generalization of quantum mechanics modifies predictions for the cosmological power spectrum. Observational cosmology is sufficiently precise to place a stringent limit, $b \leq 3 \times 10^{-34}$ eV, on the size of the nonlinear term.

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