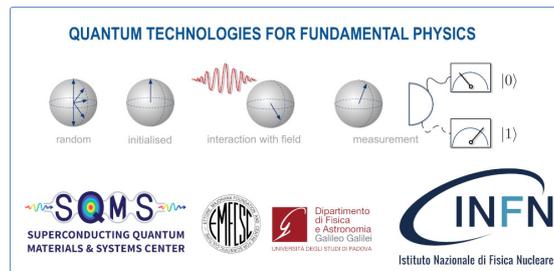


Quantum Technologies for Fundamental Physics



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The Case for Testing the Modifications of Quantum Mechanics

Saturday, 2 September 2023 15:00 (30 minutes)

We discuss the case for potential extensions to and motivate tests of quantum mechanics. We then argue that most extensions of quantum mechanics inherently include state-dependent time evolution. We then present a causal modification of quantum mechanics by adding non-linear (state-dependent) terms to the Schrodinger Equation. We find that, until recently, experimental bounds on these non-linearities are weak and discuss the types of experiments that are testing this modification. If time, we will discuss the potential dilution of laboratory effects due to amplification of quantum fluctuation in the past history of the universe, and then point out additional cosmological and astrophysical signals if such a dilution occurred.

Presenter: KAPLAN, David

Session Classification: Physics Case for Quantum Technologies