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Quantum-gravity in a dynamical system perspective

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Abstract: General Theory of Relativity and Quantum theory gives two different description of the same mother nature in the big and small scale respectively. Mathematical languages of these two theories are entirely different, one is geometric while the other one is probabilistic. This curious feature makes the merging of these theories (quantum-gravity) considerably difficult. In this manuscript, we explore quantum-gravity in a dynamical system perspective. For example, in the standard quantum theory, the wave equation is a linear partial differential equation while in General Theory of relativity, the field equations are highly nonlinear. A classical dynamical system can show very rich phase-space structures which is absent in a linear partial differential equation. In order to incorporate gravitational corrections one can think about the nonlinear extensions of quantum theory. In this manuscript such an attempt to quantum gravity is explored. Dissipative and forcing corrections are found in the newly formulated quantum equation and it's physical interpretations are given.

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