Abstract Submitted
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Wheeler Dewitt equation in spacekime[1] YUEYANG SHEN, University Of Michigan, MILEN VELEV, University of Burgas, IVO DINOV, University Of Michigan — Wheeler Dewitt quantum geometrodynamic equation is perhaps the oldest attempt to quantize gravity. In its classical form, the WDE lacks an explicit time reference. Its analytical expression suggests universal *timelessness* encoded in a frozen time and stationary operator equation . The latter presents a philosophical conundrum because it suggests the universe is static rather dynamical. This is the manifestation of background independence in canonical quantum gravity, where the physical laws dictate independence of the coordinate selection and impossibility of an absolute time. WDE implies that quantum physical states do not evolve according to external background time. In practice, quantum states are frequently observed as evolving according to some selected quantized degrees of freedom, i.e., internal time. In this current work, we explore the representation for WDE in higher-dimensional space-time representations of the universe initiated by Kaluza and Klein. We extend the univariate event ordering time from the positive reals to the complex plane, where system dynamics can be defined in terms of complex-time (kime). Following the techniques developed by Freidel, we review the 4+1 formalism that gives rise to a radial WDE foliated by Lorentzian hypersurfaces. We also give a roadmap to derive the explicit equation in 3+2 space-kime using double foliation techniques. Finally, we also provide a discussion beyond linear gravity and illustrate connections between WDE, quantum gravity, data science, and artificial intelligence. -/a

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