Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Vacuum Texture: A New Interpretation of Quantum Mechanics and a New Loophole for Bell's Inequality Measurements that preserves Local Realism and Causality[1] KEVIN MERTES, Los Alamos National Laboratory, YOKO SUZUKI, The New Mexico Consortium — We introduce a new interpretation of quantum mechanics by examining the Einstein, Podolsky and Rosen's (EPR) paradox and Bell's inequality experiments under the assumption that the vacuum has an inhomogeneous texture for energy levels below the Heisenberg time-energy uncertainty relation. In this talk, selected results from the most reliable Bell's inequality experiments will be quantitatively analyzed to show that our interpretation of quantum mechanics creates a new loophole in Bell's inequality, and that the past experimental findings do not contradict our new interpretation. Under the vacuum texture interpretation of quantum mechanics in a Bell's inequality experiment, the states of the pair of particles created at the source (e.g. during parametric downconversion) is influenced by an inhomogeneous vacuum texture sent from the measurement apparatus. We will also show that the resulting pair of particles is not entangled and that the theory of vacuum texture preserves local realism with complete causality. This talk will also suggest an experiment to definitively confirm the existence of vacuum texture. https://arxiv.org/abs/1905.04340

[1]M. Hildred Blewett Fellowship of the American Physical Society and Laboratory Directed Research and Development program of Los Alamos National Laboratory under project No. 20160584ER. LA-UR-20-30484

Kevin Mertes
Los Alamos National Laboratory

Date submitted: 08 Jan 2021 Electronic form version 1.4