

Abstract Submitted  
for the MAR13 Meeting of  
The American Physical Society

**A realist, “local,” “hidden variable” model of quantum mechanics without observers** WILLIAM SULIS, McMaster University and University of Waterloo — The violation of Bell type inequalities hinges upon the non-Kolmogorov nature of quantum probability structures. I show that a Process theory based, game theoretic formulation of quantum mechanics admits non-Kolmogorov probability structures. This formulation is realist, discrete and local at the level of space-time events while having nonlocal properties at the process level. These nonlocal effects respect relativistic constraints. Solutions to the Schrodinger equation arise through sinc interpolation of local samples generated by local path integral calculations based upon local information. Nonrelativistic quantum mechanics emerges in the continuum limit with perfect information transfer. This model avoids Kochen-Specker type restrictions and violates Bell and Leggett-Garg type inequalities. This formulation will be illustrated with a model of the classical two slit experiment.

William Sulis  
McMaster University and University of Waterloo

Date submitted: 12 Nov 2012

Electronic form version 1.4