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The Free Will Theorem and Limits on Realistic Theories
CHRISTOPHER GODFREY, Missouri Western State University — The rGRWf model (Tumulka 2006) is a proposed solution of the measurement problem of quantum mechanics involving a stochastic nonlinear wave equation embedded in a relativistic framework. Its primary feature is a mechanism that suppresses superpositions of macroscopically different states for macroscopic systems. However, the Free Will Theorem (FWT) proposed by Conway and Kochen (Conway and Kochen 2007, 2009) purports to prove that no theory that is both non-deterministic and relativistic can reproduce all possible measurement results on a system of two entangled spin-one particles. Here we examine both the rGRWf model and the FWT. It is demonstrated that underlying assumptions in the postulates of the FWT rule out certain classes of realistic physical theories. These underlying assumptions and the characteristics of physical theories permitted by the FWT axioms are discussed.

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