Nonlinear Analysis of Individual Quantum Events in a Model with Bohm Trajectories

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The quantum mechanical model under consideration describes a particle beam under the influence of an oscillator. Bohm's causal interpretation of quantum mechanics is used to calculate trajectories of the particles. Individual quantum events are defined by the intersection of the beam particle trajectories and the particle detector. The time sequence of individual quantum events is interpreted as a time series and is analyzed by linear and nonlinear methods, which involves reconstruction and investigation of the system in an embedding space. The Fourier amplitudes and the fill factors show white noise, however the Karhunen-Loeve components indicate the influence of the oscillator on the beam particles. In this model individual quantum events carry information which can be detected by the Karhunen-Loeve expansion.

Key words: Individual Quantum Events; Nonlocality; Bohm Trajectories; Time Series; Reconstruction of Trajectories.

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