IRREVESIBLE ENDOMORPHIC QUANTUM DYNAMICS AND EVENTUM MECHANICS

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ABSTRACT. It is argued that the conventional formalism of *automorphic* quantum mechanics is insufficient for the description of quantum events, such as spontaneous decays say, and the new experimental phenomena related to individual quantum measurements. Although they all have received a mathematical treatment in the phenomenological event enhanced *irreversible* quantum mechanics based on macroscopic Master dynamics and *stochastic filtering equations* of quantum open systems with counting observations, the measurement problem in these models is simply lifted to the apparatus level.

The development of quantum measurement theory within *endomorphic* microscopic quantum dynamics has indicated a possibility for resolution of this interpretational crisis by divorcing the algebra of the dynamical generators and the algebra of the actual observables, or *be*ables. It is shown that within this approach quantum causality can be rehabilitated in the form of a superselection rule for compatibility of the past events with the potential future. This gives a quantum stochastic solution, in the form of the dynamical filtering equations, of the notorious measurement problem which was tackled unsuccessfully by many famous physicists starting with Schrödinger and Bohr.

We prove that the quantum stochastic model for the continuous-in-time measurements of the spontaneous events is equivalent to a Dirac type boundary-value problem for the second quantized input "offer waves from the future" in one extra dimension, and to a reduction of the algebra of the consistent histories of past events to an Abelian subalgebra for the "trajectories of the output particles". This supports the wave-particle duality in the form of the thesis that everything in the future will be quantized waves, everything in the past will be the trajectories of recorded particles.

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