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Quantum potential and random phase-space dynamics. (English) Zbl 0996.81006
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Summary: We analyze limitations upon any kinetic theory inspired derivation of a probabilistic counterpart of the Schrödinger picture quantum dynamics. Neither dissipative nor non-dissipative stochastic phase space processes based on the white-noise (Brownian motion) kinetics are valid candidates unless additional constraints (a suitable form of the energy conservation law) are properly incorporated in the formalism.

MSC:

81P20 Stochastic mechanics (including stochastic electrodynamics)

Keywords:

probabilistic quantum dynamics; energy conservation law; stochastic processes

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