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Schrödinger's interpolating dynamics and Burgers' flows. (English) Zbl 0939.35201
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Summary: We discuss a connection (and a proper place in this framework) of the unforced and deterministically forced Burgers equation for local velocity fields of certain flows, with probabilistic solutions of the so-called Schrödinger interpolation problem. The latter allows us to reconstruct the microscopic dynamics of the system from the available probability density data, or the input-output statistics in the phenomenological situations. An issue of deducing the most likely dynamics (and matter transport) scenario from the given initial and terminal probability density data, appropriate e.g., for studying chaos in terms of density, is here exemplified in conjunction with Born's statistical interpretation postulate in quantum theory, that yields stochastic processes which are compatible with the Schrödinger picture of free quantum evolution.

MSC:

35R60 PDEs with randomness, stochastic partial differential equations
35Q53 KdV equations (Korteweg-de Vries equations)
37L55 Infinite-dimensional random dynamical systems; stochastic equations
81Q50 Quantum chaos

Keywords:

forced Burgers equation; probabilistic solutions; Schrödinger interpolation problem; probability density data; chaos

Full Text: DOI

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