SEMINARIO

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Lax pairs: Integrability & Chaos

Abstract: Although the existence of a Lax pair is the first prerequisite for so-called "complete integrability", Lax pairs are definitely not sufficient. If one considers initial-boundary value problems for well-known "completely integrable" equations, integrability may or may not persist. We mention one example (Dirichlet problem for NLS) where it does and where we have rigorous proof. We also mention numerical results by Arthur, Dorey, Parini for sine-Gordon with Robin condition, where even chaos can appear! A systematic rigorous study of this dichotomy is lacking.

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