MECCANICA
A CONFERENCE IN HONOR OF SANDRO GRAFFI ON HIS 65TH BIRTHDAY

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Toward a quantum-integrable structure of the general 1D Schrödinger equation

We review the exact WKB solution method for the 1D Schrödinger equation in the general polynomial-potential case. Analogies, with exactly solvable systems in lattice statistical mechanics and quantum field theory, suggest that our exact semiclassical solvability generalizes the latter completely integrable structures toward one we call quantum integrability; we see this as corresponding to the Liouville integrability (of 1D classical mechanics) at the quantum level. Compatibility with another major quantum structure, singular perturbation theory, requires a nontrivial analysis which is partially done.