

An algebraic approach to nonintegrability of quantum systems

Marek Kus

Center for Theoretical Physics, PAS
Al. Lotnikow 32/46
Warsaw, Poland

Joint work with: Katarzyna Karnas

We analyze (non)integrability of model quantum systems in finite-dimensional Hilbert spaces (e.g. coupled spin or spin-like systems) via their differential Galois groups using an appropriate coherent-state representation, the differential-modules formalism and the Tannaka-Krein duality. For a model $SU(3)$ -symmetric Hamiltonian system we examine its integrability dependence on a $SU(3)$ group representation with weights as parameters, and compare the results with the other known definitions of quantum (non)integrability and the outcomes of the Morales-Ramis method applied to the classical limit(s) of the considered model.