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Quantum nonintegrability and the classical limit for $\text{usp}(4)$ systems. (English) Zbl 1081.81047
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Summary: We investigate the transition from integrability to chaos in a system built of $\text{usp}(4)$ elements, both in the quantum case and in its classical limit, obtained using coherent states. This algebraic Hamiltonian consists in an integrable term plus a nonlinear perturbation, and we see that the level spacing distribution for the quantum system is well approximated by the Berry-Robnik-Brody distribution, and accordingly the classical limit displays mixed dynamics.

MSC:

81Q50 Quantum chaos

81R12 Groups and algebras in quantum theory and relations with integrable systems

70H05 Hamilton's equations

Keywords:

Quantum chaos; Algebraic models; Classical limit; Coherent states

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