

Abstract Submitted
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Quantum chaos analysis of energy and resonant spectra of ultracold molecules LUCIE AUGUSTOVICOVA, JOHN BOHN, JILA, University of Colorado - Boulder — Quantum chaos that appears in ultracold collisions of highly magnetic lanthanide atoms is investigated, using both realistic models of dysprosium atoms and a schematic model. Our model of dysprosium spectra includes an anisotropic interaction potential that scrambles Zeeman levels, and whose presence reveals degrees of chaos even for partial interaction strength. We perform statistical analyses of the energy spectrum at $B=0$ as well as the spectrum of magnetic field Fano-Feshbach resonances at $E=0$. We find that chaos is preserved in the mapping from energy spectra to magnetic field spectra within fit uncertainty. The relation between these two spectra is semiquantitatively studied within a model based on a spin Hamiltonian, mixed by potential matrices drawn at random from a Gaussian orthogonal ensemble. This work was supported by an AFOSR MURI grant.

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