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Energy spectrum of harmonically trapped two-atom system with spin-orbit and Raman coupling¹ Q. GUAN, X.Y. YIN, SEYED EBRAHIM GHARASHI, D. BLUME, Washington State Univ — Ultracold atomic gases provide a novel platform with which to study spin-orbit coupling, a mechanism that plays a central role in the nuclear shell model, atomic fine structure and two-dimensional electron gases. This paper introduces a theoretical framework that allows for the efficient determination of the eigenenergies and eigenstates of a harmonically trapped two-atom system with short-range interaction subject to an equal mixture of Rashba and Dresselhaus spin-orbit coupling as well as Raman coupling. Energy spectra for experimentally relevant parameter combinations are presented and future extensions of the approach are discussed.

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