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Three-bosons in 2D with a magnetic field SETH RITTENHOUSE, Department of Physics, US Naval Academy, BRAD JOHNSON, ANDREW WRAY, Department of Physics and Astronomy, Western Washington University, JOSE D'INCAO, JILA, NIST, and Department of Physics, University of Colorado - Boulder — Systems of interacting particles in reduced dimensions in the presence of external fields can exhibit a number of surprising behaviors, for instance the emergence of the fractional quantum Hall effect. Examining few-body interactions and effects can lead to significant insights within these systems. In this talk we examine a system of three bosons confined to two dimensions in the presence of a perpendicular magnetic field within the framework of the adiabatic hyperspherical method. For the case of zero-range, regularized pseudo-potential interactions, we find that the system is nearly separable in hyperspherical coordinates and that, away from a set of narrow avoided crossings, the full energy eigenspectrum as a function of the 2D s-wave scattering length is well described by ignoring coupling between adiabatic hyperradial potentials. In the case of weak attractive or repulsive interactions, we find the lowest three-body energy states exhibit even/odd parity oscillations as a function of total internal 2D angular momentum and that for weak repulsive interactions, the universal lowest energy interacting state has an internal angular momentum of M=3. We also discuss the effect of including finite range and higher partial-wave interactions.

Seth Rittenhouse
US Naval Academy

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