BINDING ENERGIES OF FEW-BODY DIPOLAR COMPLEXES IN TWO SPATIAL DIMENSIONS

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The bound states of dipolar particles moving in two spatial dimensions are analyzed. The system models polar molecules and atoms with large magnetic moments in 1D optical traps or dipolar excitons in semiconductor heterostructures two-body bound states.

The low-lying energy states are calculated by the proposed numerical algorithm, that was successfully applied to the investigation of the 2D Hydrogen in a tilted magnetic field and the anisotropic scattering in two dimensions [1-4]. The effects of the different short-range potentials and Van-der Waals attraction on the resulting spectrum of the system are shown.

The long-range attractive dipolar interaction is particularly interesting due to the possibility of a control of the dipole moment and the resulting potential interaction and du to prospects of a creation of a scalable quantum computer based on dipolar systems as qubits [5].

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