

Abstract Submitted
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Anisotropic threshold scattering in ultracold dipolar gases

VLADIMIR ROUDNEV, MICHAEL CAVAGNERO, University of Kentucky — The Born-Oppenheimer representation is used to calculate dipole-dipole scattering at cold and ultracold temperatures in an external electric field. Sufficiently close to threshold, scattering is dominated by only a few adiabatic channels, providing a simple picture of the scattering dynamics. The low-energy scattering cross section is driven by two types of resonances: near-threshold bound states in the lowest adiabatic channel and Feshbach/shape resonances due to the coupling between the lowest and first excited channels. The resonances of the second kind produce extremely sharp peaks in the elastic scattering cross section. In the vicinity of the peaks scattering is predominantly isotropic and can be parametrized by an effective s-wave scattering length. When the cross section is small, however, the anisotropy of the dipole-dipole interaction results in a strongly energy-dependent spacial anisotropy in near-threshold collisions.

Vladimir Roudnev
University of Kentucky

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