Resonances Induced by Dipolar Scattering

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We investigate the scattering properties of aligned dipolar molecules in ultracold gases.[1] The phase shifts and scattering lengths are calculated numerically in an adiabatic approximation, which shows several sequences of resonant states. In the high temperature limit, we use quantum virial expansion to derive the second virial coefficient of a dipolar system. It is found that the two-body scattering problem can be equivalently described by a single-channel model, and a local field theory can be applied to study the many-body problem. .

[1]K. Kanjilal, and D. Blume, Phys. Rev. A. **78**, 040703(R) (2008).