

Abstract Submitted  
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**Pseudopotential treatment of two interacting dipoles in an anisotropic harmonic trap**<sup>1</sup> K. KANJILAL, D. BLUME, Department of Physics and Astronomy, Washington State University — Recently, there has been a lot of interest in ultra cold dipolar gases. In addition to the short-range spherically symmetric contact interaction, these systems interact through the long-range anisotropic dipole-dipole potential. The ratio between the strengths of the short- and long-range potentials can be tuned experimentally. We consider two aligned dipoles in an elongated harmonic trap. Although the dipolar potential is long-ranged, it can be replaced by a zero-range pseudopotential if the length scale of the dipole-dipole interaction is much smaller than the trap length. Generalizing previous work for spherically symmetric confinement, we determine the eigenequation for two interacting dipoles under cylindrically symmetric confinement analytically. The resulting eigenenergies agree well with those obtained numerically for a shape dependent model potential. The agreement improves further if the energy dependence of the generalized scattering lengths is accounted for. Implications for the many-body system will be discussed.

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