

Abstract Submitted
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Anisotropic Rydberg Interactions DONALD BOOTH, JONATHAN TALLANT, ARNE SCHWETTMANN, JAMES SHAFFER, University of Oklahoma — Strongly-correlated systems with anisotropic interactions are a field of increasing interest in atomic physics. Unique phases of matter can form in these systems, such as supersolids and checkerboard phases. One promising system for studying these phases is an ultracold Rydberg gas. In a small applied electric field, the interactions between Rydberg atoms are anisotropic as the electric field polarizes the atoms. The anisotropy can be significant compared to the other interactions between the atoms and can be used, in principle, to dress ground state atoms in a trap. We present a theoretical calculation of the anisotropic Rydberg atom interactions of the $89D_{5/2}$, $90D_{5/2}$, and $50D_{5/2}$ states at various electric fields to investigate some aspects of the practicality of these ideas.

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