

Abstract Submitted  
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**Cs Trilobite Molecules and Rydberg Atom Interactions**<sup>1</sup> DONALD BOOTH, JONATHAN TALLANT, PATRICK ZABAWA, GREGORY PARKER, JAMES SHAFFER, University of Oklahoma — We present results on our Cs ultra-cold Rydberg atom experiments involving trilobite molecules and Rydberg atom interactions. A novel binding mechanism arises from the attractive, low-energy scattering of a Rydberg electron from a neighboring ground state atom. The states formed by this binding mechanism are referred to as trilobite states. Trilobite molecules are predicted to have giant, body-fixed permanent dipole moments ( $\sim 1$ kD). To verify these dipole moments, it is necessary to observe the response to the molecules to an electric field. We present measurements of the Stark shifts of the trilobite states in Cs due to the application of a constant external electric field. We also will present progress on studies of anisotropic Rydberg atom interactions including collision calculations. We will compare and contrast Cs trilobite molecules and Rydberg atom macrodimers.

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