Abstract Submitted
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Cesium Ultra-Long-Range Rydberg Molecules and Many-Body Physics[1] JIN YANG, AKBAR JAHANGIRI, University of Oklahoma, SETH RITTENHOUSE, United States Naval Academy, MARGARITA RESCHKE, University of Stuttgart, DONALD BOOTH, University of Oklahoma, HOSSEIN SADEGHPOUR, ITAMP, Harvard University, JAMES SHAFFER, University of Oklahoma — Ultra-long-range Rydberg molecules have received increasing interest recently because of their novel properties such as the ability to serve as an electron trap, the potential to possess kilo-Debye dipole moments, and their unique binding mechanism. Recently, experiments focusing on Rydberg P-state and D-state molecules have revealed interesting new features of these novel molecules, like coupling between singlet and triplet scattering channels, p-wave scattering dominated states and their behavior in magnetic fields. In this presentation, we report our recent observation of Cesium D-state ultra-long-range Rydberg molecules and compare our observations to theoretical calculations. We also report our preliminary data on "polymer" molecules, which are formed by one Cs Rydberg atom but more than one Cs ground state atom. The transition from a few-body system to a many-body system can provide insight into many-body physics.

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