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Ultralong-Range Cs D-State Rydberg Molecules[1] JIN YANG, University of Oklahoma, MARGARITA RESCHKE, University of Stuttgart, JOHN FURNEAUX, DONALD BOOTH, JAMES SHAFFER, University of Oklahoma — Ultralong-range Rydberg molecules are interesting because they are formed by electron scattering of bound Rydberg electrons from ground state atoms found near an excited Rydberg atom. Because of their novel physical properties, such as kilo-Debye permanent dipole moments and novel binding mechanism, they are receiving increasing interest. Here, we present our work on ultralong-range Cs Rydberg molecules correlating asymptotically to d-states. Through comparison with prior experimental results on Rb and Cs ultralong-range molecules, we explain how state mixing and the details of different scattering processes work to give distinctive properties to these molecules that depend on quantum state and atomic species.

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