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Observation of Cs Rydberg atom macrodimers ARNE SCHWETTMANN, K. RICHARD OVERSTREET, JONATHAN TALLANT, DONALD W. BOOTH, JAMES P. SHAFFER, University of Oklahoma — We report the observation of cold Cs Rydberg atom molecules bound at internuclear separations of R$\sim$3-9 μm. The bound states result from avoided crossings between Rydberg atom pair interaction potentials in an applied electric field. The molecular states can be modified by changing the applied electric field. The molecules are observed by mapping the radial separation of the two Rydberg atoms as a function of time delay between excitation and detection using the Coulomb repulsion of the ions after pulsed field ionization. Measurements were performed for 63D+65D, 64D+66D, 65D+67D, and 66D+68D pairs. The experiment is in good agreement with calculations of the pair interactions for these states.

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