DATA AND ANALYSIS OF SPIN-ORBIT COUPLED $A^1\Sigma_u^+$ AND $b^3\Pi_u$ STATES OF Cs_2

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Following work with various collaborators on analogous states of Na_2, NaRb, KRb, NaCs, KCs, RbCs and Rb_2, we have recently completed a study of the $A^1\Sigma_u^+$ and $b^3\Pi_u$ states of Cs_2, based on experimental data obtained in Orsay, Temple University, Innsbruck and Riga. Potentials and spin-orbit coupling functions were fit to the data using both a coupled-channel approach and the discrete variable representation method. As with other species, the goal has been to accurately characterize the energy level structure to facilitate experiments in which cold ground state molecules are produced from cold atoms or Feshbach resonance dimers by stepwise excitation and decay, and also to facilitate excitations to higher lying states. For Cs_2, second-order spin-orbit shifts become significant, and since these are typically difficult to obtain experimentally, *ab initio* calculations provided estimates. We will display the excellent quality of the fits to the experimental data, including a modeling of the $b^3\Pi_{1u}$-$^3\Pi_{0u}^+$ fine structure interval and Λ-doubling effect in the $b^3\Pi_{0u}^{\pm}$ state.

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