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Experimental Studies of the NaCs $5^3\Pi_0$ and $1(a)^3\Sigma^+$ States[1] SETH ASHMAN, BRETT MCGEEHAN, CHRISTOPHER WOLFE, CARL FAUST, JOHN HUENNEKENS, Lehigh University — We present experimental studies of the NaCs molecule that are currently underway in our laboratory. The optical-optical double resonance method is used to obtain Doppler-free excitation spectra for several excited states. Selected data from the $5^3\Pi_0$ electronic state are used to obtain Rydberg-Klein-Rees (RKR) and Inverse Perturbation Approach (IPA) potential curves. We are also mapping the repulsive wall of the $1(a)^3\Sigma^+$potential using many resolved bound-free fluorescence spectra from individual ro-vibrational levels of the $5^3\Pi_0$ electronic state to the $1(a)^3\Sigma^+$ state. Using the determined $5^3\Pi_0$ state potential we fit the repulsive wall of the $1(a)^3\Sigma^+$ state to reproduce the experimental spectra using LeRoy's BCONT program. A slightly modified version of BCONT is also used to fit the relative transition dipole moments, $\mu_e(R)$, as a function of internuclear separation R, for the various bound-free electronic transitions.

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