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Fitting an Experimental Potential Energy Curve for the $4^3\Pi$ Electronic State of NaCs ANDREW STEELY, Susquehanna University, RACHEL L. MYERS, R. F. MALENDA, Moravian University, CARL FAUST, Susquehanna University — We present results from experimental studies of the $4^3\Pi$ electronic state of the NaCs molecule. This electronic state is interesting in that its potential energy curve exhibits a double minimum. As a result, interference effects are observed in the resolved bound-free fluorescence spectra. The optical-optical double resonance method was used to obtain Doppler-free excitation spectra for the $4^3\Pi$ state. To aid in level assignments, simulations of resolved bound-free fluorescence spectra were calculated using the BCONT program (LeRoy). Spectroscopic constants were determined to summarize data belonging to inner well, outer well, and above barrier regions of the electronic state. Several approaches are under consideration to construct a potential energy curve. The RKR and IPA methods were used to determine a pointwise potential energy curve to reproduce experimental level energies. Theoretical calculations are also underway to determine an analytic form of the potential energy curve for comparison with experimental data and results of the IPA fitting. Initial forms under investigation include a sum of two Morse potentials combined with a switching function and a Spline- Exponent-Morse/Long Range (SEMLR) form calculated using the betaFIT program (LeRoy).

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