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Photoassociation of ultracold NaCs via $(4)\Omega=1$ yields deeply-bound, highly polar $X^1\Sigma^+$ states AMY WAKIM, PATRICK ZABAWA, N.P. BIGELOW, University of Rochester — We determine the presence of a previously unknown avoided crossing between the $(3)\Omega=1$ and $(4)\Omega=1$ long-range states which may contribute to the production of deeply bound molecules populating $X^1\Sigma^+(v = 4-6, 8, 9, 11, 13, 15-17, 19, 21, 23-25, 31)$. A combination of pulsed depletion spectroscopy and photoassociation (PA) spectroscopy is utilized to assign PA resonances, illuminate the character of the potential energy curves involved, and label the rotational and vibrational population of the final distribution. We present an improved C_6 coefficient for the $(4)\Omega=1$ and the assignments for all twenty-two PA resonances detuned from the Cs $6^2P_{3/2}$ asymptote.

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