Abstract Submitted
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**Effects of perturbations in photoassociation spectra of ultracold $Cs_2$**[1] MARIN PICHLER, Goucher College, Baltimore MD 21204, WILLIAM C. STWALLEY, University of Connecticut, Storrs CT 06269, OLIVIER DULIEU, Laboratorie Aimé Cotton, CNRS, Orsay, France — Perturbations in photoassociation spectra of ultracold cesium are presented. High precision photoassociation spectra up to 54 $cm^{-1}$ below the Cs $(6S_{1/2})$+Cs$(6P_{1/2})$ asymptote revealed perturbations related to resonant coupling between electronic states of the same symmetry but belonging to different asymptotes. The perturbations, which are manifested as irregularities in vibrational level spacings, are most pronounced for the $0_u^+$ state, but to some extent present in the $1_g$ and $0_g^-$ states, which are also affected by predissociation. Theoretical calculations of perturbations for all three states and found qualitative agreement with the experimental results. Additionally, we present perturbations involving pure long range $0_g^-$ state and the dark $2_u$ state below the Cs$(6S_{1/2})$+Cs$(6P_{3/2})$ asymptote. Level shifts and additional spectral features are found in this case.

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