LASER-INDUCED GRATING STUDIES OF THE PREDISSOCIATION DYNAMICS OF OClO

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The multidimensional nature of $OClO^*$ predissociation was studied using a double-resonant, nonlinear optical technique. A two-color variant of laser-induced grating spectroscopy was configured to investigate the influence of initial nuclear motion on the $\tilde{A} \leftarrow \tilde{X}$ state absorption spectrum of chlorine dioxide. Grating-forming beams tuned to a transition in the neighborhood of the origin band selectively "tag" a well-defined subset of ground state molecules so that their near-ultraviolet absorption spectrum can be viewed in isolation by the diffractive scattering of a third probe beam. Near ultraviolet spectra of the (1,0,0), (0,1,0) and (1,1,0) ground state levels were obtained. Analysis of these spectra indicate a mode-selective increase in the predissociation rate due to ground state vibrational motion.