PHOTODISSOCIATION DYNAMICS OF CHLORINE DIOXIDE

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A ground state population depletion grating was used to elucidate the effects of initial nuclear motion on the photodissociation dynamics of chlorine dioxide. The ultraviolet absorption of OClO occurs via the $\mathrm{A}^2\mathrm{A}_2 \leftarrow \mathrm{X}^2\mathrm{B}_1$ transition, but dissociation of OClO* proceeds on several different excited state surfaces leading to two distinct product channels. Since several excited bending states (ν_2) are populated at room temperature, a depletion grating can be formed involving these vibrational states by the interference of two degenerate pump beams tuned to transitions which lie below the predissociation threshold. A probe beam was tuned through the dissociation region to record the $A \leftarrow X$ absorption spectra of specific vibrational states.