

## ROVIBRATIONAL LEVEL STRUCTURE OF ACETYLENE BY STIMULATED EMISSION PUMPING: CORIOLIS COUPLING BETWEEN $\nu_2 + 4\nu_4$ AND $7\nu_4$

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Stimulated emission pumping (SEP) spectroscopy has been used to investigate the rovibrational level structure of  $S_0$  acetylene with  $0.1 \text{ cm}^{-1}$  resolution at a vibrational energy of approximately  $4400 \text{ cm}^{-1}$ . Both the  $e$  and  $f$  parity levels of the expected zero-order bright state  $\nu_2 + 4\nu_4$  ( $\ell = 0, 2$ ) are observed to be doubled by a rotationally inhomogeneous perturbation. SEP spectra obtained using  $S_1$  intermediate levels with  $K = 1$  vs.  $K = 0$  reveal complementary intensity patterns, indicating that the perturbation follows a selection rule for vibrational angular momentum of  $\Delta\ell = \text{odd}$ . The perturbation is assigned to a Coriolis interaction between  $\nu_2 + 4\nu_4$  and the pure bending dark state  $7\nu_4$ . Zero-order vibrational energies and B values, as well as the Coriolis coupling coefficient, are derived from a fit of greater than 60 rovibrational levels of both parities with  $J = 1$  to 13. Parameters derived from the fit are compared with predictions based on previous infrared and dispersed fluorescence studies. Axis-switching effects are also found to contribute significantly to the observed intensities.