THE DETERMINATION OF \( C_0 \) (OR \( A_0 \)), \( D_0^K \), \( H_0^K \), AND SOME DARK STATES FOR SYMMETRIC-TOP MOLECULES FROM INFRARED SPECTRA WITHOUT THE NEED FOR LOACALIZED PERTURBATIONS

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Several different combinations of allowed and apparently unperturbed rovibrational transitions are used to obtain the \( K \)-dependent rotational constants, \( C_0 \), \( D_0^K \), and \( H_0^K \). A necessary ingredient for the application of this technique is a band with selection rules \( \Delta k = \pm 1 \), \( \Delta \ell = \mp 2 \), and appropriate hot or difference bands. Examples are given for boron trifluoride (BF\(_3\)), sulfur trioxide (SO\(_3\)), and cyclopropane (C\(_3\)H\(_6\)) for which there are microwave measurements that provide a check on the derived constants. Examples are also given for the determination of dark states from difference bands, and/or hot bands, and also whole forbidden bands that arise from mixing with distant energy levels.