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 Δk = ± 1, Δl = ∓ 2, and appropriate hot or difference bands. Examples are given for boron trifluoride (BF_3), sulfur trioxide (SO_3), and cyclopropane (C_3H_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.