ROTATIONAL STRUCTURE IN THE $\tilde{B}$-$\tilde{X}$ ORIGIN BAND OF THE METHYL RADICAL

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The predissociated $\tilde{B}\ ^2A_1'$ state of CH_3 has a sub-picosecond lifetime,[a] which causes all absorption bands in the $\tilde{B}\ ^2A_1' \leftarrow \tilde{X}\ ^2A_2''$ system to be unstructured, and molecular constants for the $\tilde{B}$ state must be inferred from analysis of partly resolved lines in the corresponding bands of CD_3.[b] We observe isolated rotational transitions in the $\tilde{B} \leftarrow \tilde{X}$ origin band of CH_3 using two-color resonant four-wave mixing (TC-RFWM) spectroscopy with an IR laser that excites known lines in the ν_3 fundamental band[c] to label specific N, K levels of the $\tilde{X}$ state. Analysis of TC-RFWM spectra involves fitting complex Lorentzian lineshapes and yields an updated value of $46,241 \pm 5$ cm^{-1} for T_0 of the $\tilde{B}$ state.

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[b] G. Herzberg, *Proc. R. Soc. London Ser. A* **262**, 291-317 (1961).
[c] T. Amano, P. F. Bernath, C. Yamada, Y. Endo, and E. Hirota, *J. Chem. Phys*. **77**, 5284-5287 (1982).