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## The $\nu_3$ fundamental band of the methyl radical

IN discussing near-IR absorption bands in IRS7, Allen and Wickramasinghe<sup>1</sup> remark that "laboratory data are not available for even quite simple, incompletely bonded molecules (for example, CH<sub>3</sub>) such as might be found in the interstellar environment".

We have recently performed a laboratory measurement of the  $\nu_3$  fundamental band ( $\nu_0 = 3,160.820~\text{cm}^{-1}$ ) of CH<sub>3</sub> in absorption using a difference-frequency laser<sup>2</sup>. The most prominent feature in the spectrum is the  $^{\text{r}}Q_0(N)$  ( $N=2,4,6,\ldots$ ) sub-branch. The transition frequency of

the strongest line,  ${}^{r}Q_{0}(2)$ , is 3,154.7459 cm $^{-1}$  (= 3.16983  $\mu$ m). Other strong lines at (300 K) are calculated to be: 3,101.045, 3,128.548, 3,199.730, 3,217.754, and 3,224.396 cm $^{-1}$ . However, none of the prominent features reported by Allen and Wickramasinghe seem to fit our observed transition frequencies.

The methyl radical is expected to be an important species in certain interstellar sources<sup>3</sup>. In particular, estimates of the abundance of CH<sub>3</sub> in the atmosphere of the nearby carbon star IRC +10°216 indicate that its abundance relative to CO is ~10<sup>-4</sup> (ref. 4 and personal communications from E. M. McCabe, R. C. Smith and R. E. S. Clegg, and A. Kinney). Thus the methyl radical should be detectable

in this source and we plan to conduct an IR search for it in the very near future.

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