TEMPERATURE RESOLVED 3-D SUBMILLIMETER SPECTROSCOPY OF ASTRONOMICAL 'WEEDs'.

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We have previously reported on the experimental spectroscopic approach that makes possible the calculation of lower state energy levels and transition strengths without the need for spectral assignment [a]. Analysis of the temperature dependent measurements significantly improves the estimate of the lower state energy, recovered by division of temperature dependent spectral intensities. Also, this approach provides results both in the standard astronomical catalog form (frequency, line strength, lower state energy) and as experimental temperature dependent spectra. We are reporting on temperature resolved 3-D spectroscopy of ethyl cyanide — a well known astronomical 'weed'.

[a]"An experimental approach to the prediction of complete millimeter and submillimeter spectra at astrophysical temperatures: Applications to confusion-limited astrophysical observations," I. R. Medvedev and F. C. De Lucia, Ap. J. 656, 621-628 (2007).