THE $v_t = 2$ STATE OF METHANOL

CAROLYN BRAUER, JOHN C. PEARSON, BRIAN J. DROUIN, and HERBERT PICKETT, *Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109*; LI-HONG XU, JONATHAN FISHER, HONGYU SHI, *Centre for Laser, Atomic and Molecular Sciences (CLAMS), Department of Physical Sciences, University of New Brunswick, Saint John, N.B., Canada E2L 4L5*.

Methanol is nearly ubiquitous in the interstellar medium with peak abundances in hot cores associated with star formation. A number of telescopes beginning operations soon will detect the spectrum of methanol to higher quantum numbers and frequencies than previously possible. As a result, it will be necessary to have precise knowledge of the spectrum of methanol in many higher states. The $v_t = 2$ state is the first torsional state that lies above the internal rotation barrier, thus, while the ground state rotational structure is characterized as torsionally modified rotation, the second excited torsional state is best described as rotationally modified torsion. Surprisingly the $v_t = 2$ state is relatively free of pathologies relative to the $v_t = 0$ and $v_t = 1$ states. A data set comprising new data between 7 and 2540 GHz has been combined with existing TUFIR data. The spectral data includes many new levels to $K = 10$ and $J = 44$ along with some additional higher K a-type transitions. The results of the analysis will be discussed.