TERAHERTZ SPECTROSCOPY OF HIGH K METHANOL TRANSITIONS

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Methanol is one of the primary sources of line confusion in warm star-forming regions. Herschel has detected rotational transitions in $v_t = 0, 1, 2$ with rotational quantum numbers to $J > 35$. The Herschel observations are clearly beam diluted on the hottest regions. Since ALMA will not suffer from similar beam dilution it is likely that significantly more methanol states are quickly detected. Since the existing detections largely span the previously analyzed space of laboratory data, a program of THz measurements of methanol has been undertaken to identify higher K_a states and to connect the $v_t = 2$ manifold more completely to the rest of the available data with microwave accuracy. During the course of this work it became possible to directly compare TuFIR, FTIR, Laser Sideband, Quantum Cascade Laser, and conventional millimeter-wave spectroscopy. It has also been possible to assess the strengths and weakness of the rho-axis method (RAM) Hamiltonian in extrapolation for methanol.

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