HIGH RESOLUTION DIODE LASER SPECTROSCOPY OF CARBONYL FLUORIDE AT STRATOSPHERIC TEMPERATURES

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The 1940 cm^{-1}band system of carbonyl fluoride, COF_2, consisting of ν_1 (1944.6 cm^{-1}) in Fermi resonance with ν_2(1913.8 cm-1) is studied using lead-salt diode lasers tuned by temperature and current control. This molecule is important in heterogeneous chemical processes in polar stratospheric clouds and this band is used in atmospheric retrievals. The gas is contained in a multi-jacketed absorption cell and cooled to c. 210K by a circulating fluorinated fluid which is precooled in bath of methanol and dry ice. The improved signal to noise ratio and lineshapeof the diode spectra over previous Fourier Transform measurements allow further spectroscopic features to be unambigously identified.

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