

STABILIZED TUNABLE DIODE LASER MEASUREMENTS OF THE P (2) LINE IN THE $^{13}\text{C}^{16}\text{O}$ FUNDAMENTAL BAND BROADENED BY HELIUM AT TEMPERATURES BETWEEN 11.5 AND 298.6 KELVIN

A. MANTZ, *Department of Physics, Astronomy and Geophysics, Connecticut College, New London, CT 06320*; A. HENRY and A. VALENTIN, *Laboratoire de Physique Moléculaire et Applications, Université Pierre et Marie Curie, F-75252 Paris Cedex 05, France*.

We interfaced a collisional cooling cell to the interferometrically stabilized tunable diode laser system which operates in the LPMA. We used this system to determine accurate He broadening parameters and collisional cross sections for the P(2) line in the fundamental band of CO at room temperature and at intermediate temperatures down to 11.5 Kelvin. Below approximately 30 Kelvin we used the collisional cooling technique to measure the CO absorption features with sample pressures as high as 2.4 Torr at 11.5 K and 5 Torr at 20 K. We also determined a precise value for the temperature dependence of the broadening parameter, in T^{-n} with n equal to 0.548 ± 0.010 . Our results agree well with the microwave results for the $J=1$ to $J=2$ rotational transitions measured over the same range of temperatures which were reported previously by Beaky, De Lucia, et al.