THE APPLICATION OF A VUV-FT SPECTROMETER AND SYNCHROTRON RADIATION SOURCE TO MEASUREMENTS OF: THE γ (3,0) AND THE β (6,0) BANDS OF NO

K. W. -S. LEUNG and A. S. -C. CHEUNG, *University of Hong Kong, Hong Kong*; K. YOSHINO, J. R. ESMOND and W. H. PARKINSON, *Harvard Smithsonian Center for Astrophysics, Cambridge, MA 02138, U.S.A.*; A. P. THORNE, J. E. MURRAY, G. COX, and R. C. M. LEARNER, *Imperial College of Science, Technology, and Medicine, London, U.K.*; K. ITO and T. MATSUI, *Photon Factory, KEK, Tsukuba, Ibaraki 305, Japan*; T. IMAJO, *Kyushu University, Fukuoka 812, Japan*.

The Imperial College VUV-FT spectrometer has been equipped with optically contacted, beam splitters made from single crystals of MgF_2 and the short wavelength performance has been demonstrated down to $\sim$139 nm. To make ultrahigh resolution VUV photoabsorption cross section measurements with the VUV-FTS require a pure continuum source below 190 nm and the best choice: is synchrotron radiation from a storage ring facility. Moreover a suitable zero-dispersion predisperser is available on beam line 12-B of the synchrotron radiation source at the Photon Factory. We therefore moved the IC VUV FT spectrometer from Imperial College, London to the Photon Factory, Japan to exploit the bandwidth-limited synchrotron radiation as a background source for FT absorption spectroscopy.
The VUV-FT spectra of the $A\ ^2\Sigma^+ - X\ ^2\Pi$ (3,0) and the $B\ ^2\Pi - X\ ^2\Pi$ (6,0) bands of NO have been recorded with an instrumental resolution of 0.06 cm^{-1}(about a half of the Doppler widths). Accurate line positions and cross sections of the A(3) and B(6) levels have been determined. Absolute band oscillator strengths from the integration of cross sections of individual line have been obtained.
This work is partly supported by NSF Division of Atmospheric Sciences grant ATM-94-22854 to Harvard College Observatory, and by NASA Upper Atmospheric Research Program under Grant No. NAG5-484 to the Smithsonian Astrophysical Observatory. We also acknowledge the support of the Paul Instrument Fund of the Royal Society for the development of the UV-FT spectrometer. The FTS measurements at the Photon Factory were made with the approval of the Photon Factory Advisory Committee (94G367). KY thanks the Japan Society for the Promotion of Science for support.