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Mapping of SO_2 and HDO on Venus using thermal infrared imaging spectroscopy

T. Encrenaz (1), T. K. Greathouse (2), H. Roe (3), J. H. Lacy (4), M. J. Richter (5), B. Bézard (1), T. Fouchet (1), and T. Widemann (1)

(1) Paris Observatory, LESIA, Meudon, France (therese.encrenaz@obspm.fr, +33 1 4507-2806), (2) SWRI, San Antonio, TX, USA, (3) Lowell Observatory, Flagstaff, AZ, USA, (4) Dept. Astronomy, U. Texas, Austin, TX, USA, (5) Physics Dept., UC Davis, CA, USA

Near-infrared observations of sulfur dioxide and water vapor on Venus have been reported by SPICAV/SOIR on Venus Express using the solar occultation technique (Belyaev et al. JGR 113, E00B25, 2008). These observations suggest that the distributions of these species show significant spatial and temporal variations. Ground-based imaging spectroscopy at high resolution provides a complementary method to study both species over the clouds. We have been using the TEXES high-resolution imaging spectrometer at the NASA Infrared Telescope facility to map sulfur dioxide and deuterated water over the disk of Venus. Observations took place on January 10-14, 2012. The diameter of Venus was 13 arcsec, with an illumination factor of 80%. Data were recorded in the 1350-1370 cm-1 range (around 7.35 micrometers) with a spectral resolving power of about 70000 and a spatial resolution of about 1 arcsec. The Doppler velocity of Venus was -10 km/s, corresponding to a Doppler shift of + 0.045 cm-1 at 1350 cm-1. Both HDO and SO_2 have been identified in our spectra. Maps of the two species will be presented and discussed.