



Ground-based imaging spectroscopy of Venus: variability of HDO and SO₂ between 2012 and 2017 and analysis of the thermal structure

Therese Encrenaz (1), Thomas Greathouse (2), Matthew Richter (3), Curtis DeWitt (3), Thomas Widemann (1), Bruno Bezdard (1), Thierry Fouchet (1), Sushil Atreya (4), and Hideo Sagawa (5)

(1) Paris Observatory, LESIA, Meudon, France (therese.encrenaz@obspm.fr), (2) SwRI, San Antonio, TX, USA, (3) University of California Davis, CA, USA, (4) University of Michigan, Ann Arbor, MI, USA, (5) Kyoto-Sangyo University, Kyoto, Japan

We have continued our monitoring of the lower mesosphere of Venus using high-resolution imaging spectroscopy, using the Texas Echelon Cross Echelle Spectrograph (TEXES) at the Infrared Telescope Facility (IRTF) at Maunakea Observatory (Hawaii). New observations have been performed in January 2016, December 2016, and (weather permitting) January 2017. We have mapped the abundances of SO₂ and H₂O (through HDO) over the H₂SO₄ cloud (at 7 μ m) and within this cloud (at 19 μ m) to study the short-term and long-term variability of the two species. HDO variations in time and space are moderate, while SO₂ exhibits strong variations over the disk and on a timescale of a few hours (Encrenaz et al. AA 595, A74, 2016). The study of strong and weak CO₂ lines, at 7 and 19 μ m, also allows us to retrieve information on the thermal structure as a function of latitude and local hour. We will present an overview of our results on the variability of SO₂ and HDO between 2012 and early 2017, and an analysis of the thermal structure at morning and evening terminators.