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Imaging spectroscopy of Mars in the thermal infrared: seasonal variations of H_2O_2 and mapping of the D/H ratio

Therese Encrenaz (1), Curtis DeWitt (2), Matthew Richter (2), Thomas Greathouse (3), Thierry Fouchet (1), Franck Lefevre (4), Franck Montmessin (4), Francois Forget (5), Bruno Bezard (1), and Sushil Atreya (6)

(1) Paris Observatory, LESIA, Meudon, France (therese.encrenaz@obspm.fr), (2) University of California Davis, CA, USA, (3) SwRI, San Antonio, TX, USA, (4) LATMOS, IPSL, Paris, France, (5) LMD, IPSL, Paris, France, (6) University of Michigan, Ann Arbor, MI, USA

Since 2002, we have been monitoring the spatial distribution and the seasonal variations of H_2O_2 on Mars, using high-resolution imaging spectroscopy with the Texas Echelon Cross Echelle Spectrograph (TEXES) at the Infrared Telescope Facility (IRTF) at Maunakea Observatory (Hawaii). These observations have shown that a better agreement with global climate models is obtained when heterogeneous chemistry is introduced in the photochemical model (Encrenaz et al. 2015, AA 578, A127). In addition, in April 2014, we have obtained a map of D/H on Mars using the Echelon Cross Echelle Spectrograph (EXES) aboard the stratospheric Observatory for Infrared Astronomy (SOFIA; Encrenaz et al. 2015, AA 586, A62). In 2016, new observations have been obtained on H_2O_2 with TEXES and on D/H with EXES, allowing us to better analyze the seasonal variations of these parameters. These data will be presented and compared with previous measurements.