Geophysical Research Abstracts
Vol. 19, EGU2017-8735, 2017
EGU General Assembly 2017
© Author(s) 2017. CC Attribution 3.0 License.

Measuring molecular abundance profiles from 5 microns ground-based spectroscopy in support of JUNO investigations

Doriann Blain (1), Thierry Fouchet (1), Thérèse Encrenaz (1), Pierre Drossart (1), Thomas Greathouse (2), Glenn Orton (3), and Leigh Fletcher (4)

(1) LESIA, Observatoire de Paris, France (Pierre.Drossart@obspm.fr), (2) SWRI, San Antonio, United States of America (tgreathouse@swri.edu), (3) JPL, NASA, United States of America (Glenn.S.Orton@jpl.nasa.gov), (4) University of Leicester, United Kingdom (leigh.fletcher@leicester.ac.uk)

We report on early results of an observational campaign to support the Juno mission. At the beginning of 2015, using TEXES (Texas Echelon cross-dispersed Echelle Spectrograph), mounted on the NASA Infrared Telescope Facility (IRTF), we obtained data cubes of Jupiter in several spectral ranges between 2100 and 2200 cm^{-1} (4.5 - 4.7 μm) which probes the atmosphere in the 1-4 bar region, with a spectral resolution of $R \approx 7000$ and an angular resolution of $\approx 1.5''$. This dataset is analyzed by a code which combines a line-by-line radiative transfer model with a non-linear optimal estimation inversion method. The inversion takes into account the abundance profiles of AsH_3, CO, GeH_4 and H_2O, as well as clouds contribution, in addtion to the abundance profiles of NH_3 and PH_3. We will present the inverted abundance profiles, the spatial distribution of the molecular abundances, their significance for the understanding of Jupiter's atmospheric dynamics, and how this will be useful for the determination of water abundance up to 200 bars, which is one of the main objectives of the instrument MWR (MicroWave Radiometer) mounted on the Juno spacecraft. This work will also be useful to prepare the analysis of the JIRAM (Jovian InfraRed Auroral Mapper) 5-microns data aboard Juno.