



Publication Year	2018
Acceptance in OA	2020-10-05T13:15:46Z
Title	Limb observations of H3+ in the mid- and low latitude Jovian atmosphere with the JIRAM spectrometer
Authors	MIGLIORINI, Alessandra, Atreya, Sushil K., GRASSI, Davide, Levin, Steven, TOSI, Federico, Bolton, Scott, ALTIERI, FRANCESCA, PLAINAKI, CHRISTINA, Moriconi, Maria Luisa, SINDONI, Giuseppe, ADRIANI, Alberto, MURA, Alessandro, Gerard, Jean-Claude, Lunine, Jonathan, Olivieri, Angelo, Connerney, John, PICCIONI, GIUSEPPE, Dinelli, Bianca Maria
Handle	http://hdl.handle.net/20.500.12386/27579
Volume	42

Space Studies of the Earth-Moon System, Planets, and Small Bodies of the Solar System (B)
Juno at Jupiter (B5.1)

LIMB OBSERVATIONS OF H₃⁺ IN THE MID- AND LOW LATITUDE JOVIAN ATMOSPHERE WITH THE JIRAM SPECTROMETER

Alessandra Migliorini, alessandra.migliorini@iaps.inaf.it
INAF - IAPS Rome, Roma, Italy
Bianca Maria Dinelli, bm.dinelli@isac.cnr.it
ISAC(CNR), Bologna, Italy
Maria Luisa Moriconi, m.moriconi@isac.cnr.it
ISAC(CNR), Roma, Italy
Francesca Altieri, francesca.altieri@iaps.inaf.it
INAF - IAPS Rome, Rome, Italy
Alberto Adriani, alberto.adriani@iaps.inaf.it
INAF - IAPS Rome, Roma, Italy
Alessandro Mura, alessandro.mura@iaps.inaf.it
IAPS/INAF, Roma, Italy
Giuseppe Piccioni, giuseppe.piccioni@iaps.inaf.it
INAF-IAPS, Rome, Italy
Federico Tosi, federico.tosi@iaps.inaf.it
INAF - IAPS Rome, Rome, Italy
Giuseppe Sindoni, giuseppe.sindoni@iaps.inaf.it
INAF - IAPS Rome, Italy
Davide Grassi, davide.grassi@iaps.inaf.it
INAF - IAPS Rome, Roma, Italy
Scott Bolton, sbolton@swri.edu
Southwest Research Institute, San Antonio, Texas, United States
John Connerney, jack.connerney@nasa.gov
Space Research Corporation, Annapolis, Maryland, United States
Sushil K. Atreya, atreya@umich.edu
University of Michigan, Ann Arbor, Michigan, United States
Steven Levin, steven.levin@jpl.nasa.gov
Jet Propulsion Laboratory, Pasadena, California, United States
Jonathan Lunine, jlunine@astro.cornell.edu
Cornell University, Ithaca, New York, United States
Jean-Claude Gerard, jc.gerard@ulg.ac.be
Universite de Liege, Liège, Belgium
Angelo Olivieri, angelo.olivieri@asi.it
ASI Italian Space Agency, Matera, Italy
Christina Plainaki, christina.plainaki@iaps.inaf.it

The Jupiter Infrared Auroral Mapper (JIRAM) instrument, onboard the NASA's Juno mission, is composed of a camera in the L and M bands, and a spectrometer covering the 2-5 μm region. During the period from August 2016 to March 2017, when five mission flybys were completed, it was possible to observe with JIRAM the Jupiter's atmosphere in a very slant perspective, allowing sampling the stratosphere at different altitudes. We took advantage of H_3^+ emissions in the 3-4 μm spectral band, observed with JIRAM in the above reported period, to retrieve the H_3^+ densities and temperatures, through the inversion method described in Dinelli et al. (2017), at altitudes from 200 to 700 km above the 1-bar level, and in the latitude region from 60° equatorward, in both hemispheres. Retrieved volume mixing ratios are on average higher in the Southern hemisphere than in the Northern, in accordance with previous observations in the auroral region (Adriani et al. 2017). Temperature values increase quite uniformly with altitude in both hemispheres, and are generally in agreement with temperature fields retrieved with Cassini/CIRS at 200-300 km (Sinclair et al. 2017). Finally, H_3^+ concentrations decrease from about 10^6 mol/cm^3 at 200-300 km to $3 \times 10^5 \text{ mol/cm}^3$ at 600 km.

Although the coverage of analysed data does not allow investigating the H_3^+ variability with respect to local time, the available data potentially allow to retrieve a 3-dimensional structure of the atmosphere in the 200-700 km altitude range, which has not been well addressed by previous ground-based and space observations.

Acknowledgments The project JIRAM is funded by the Italian Space Agency.