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Juno at Jupiter (B5.1)

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

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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 H3+ 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, H3+ concentrations decrease from about 106 mol/cm^3 at 200-300 km to 3x10^5 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.

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