

JIRAM Observations of Jupiter's Auroral Regions in the 3-4 μm spectral range

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Throughout the first orbit of NASA's Juno spacecraft about Jupiter, the Jupiter InfraRed Auroral Mapper (JIRAM - Adriani et al. 2014) observed the northern and southern polar regions several times. In these observations we identified emissions of H_3^+ (trihydrogen cation) and CH_4 (methane). Partial spatial coverage of the main ovals obtained during the first orbit proved sufficient to map different regions of H_3^+ temperature and abundance using emission lines in the wavelength range of 3-4 μm . These results have been the subject of three papers [Dinelli et al. (2017), Adriani et al. (2017), Moriconi et al. (2017)]. Direct comparison of the Northern/Southern auroras demonstrated that the Southern hemispheric auroral emissions were always more intense than the northern ones. The analysis method, described by Dinelli et al. (2017), yields both H_3^+ column densities (CD) and temperatures and an estimate of methane distribution over the auroral regions. Analysis of the high spatial resolution JIRAM measurements shows that the aurora is asymmetric over both poles, with CD and temperature ovals not superimposed and not exactly located where models and previous observations suggested. Here we report the results obtained from the first JUNO orbit along with the results obtained using the same analysis method to the entire JIRAM spectral observations of the auroral regions.

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References

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