P24D-01 - Ganymede as observed by Juno/JIRAM in PJ34 and PJ35 (June and July 2021) (Invited)

Tuesday, 14 December 2021

21:30 - 21:41

Convention Center - Room 395-396 (Third)

Abstract

This was a key year for the NASA Juno mission to observe the largest Galilean moon Ganymede: one close flyby took place on 7 June 2021 during perijove 34 (PJ34) from a minimum altitude of 1053 km, and another observation took place on 20 July 2021 during perigiove 35 (PJ35) from a minimum altitude of 50,719 km. On June 7, JIRAM took 7 images in L band and 7 in the M band, and ~1500 spectra of the surface. On July 20, JIRAM took ~20 images in L band and ~20 in the M band, and ~3000 spectra of the surface.
JIRAM data acquired in PJ34 yielded unprecedented pixel resolution values between 0.25 and 0.61 km/px (average value 0.36 km/px), which is 92 times better than the previous flyby and 3 to 7 times better than the most resolved hyperspectral image ever acquired in the past by the Galileo/NIMS instrument at Ganymede. On the other hand, those obtained in PJ35 achieved a maximum spatial resolution of 12 km/px. These data overall complement those acquired in previous 14 orbits, in particular those obtained in PJ24 on 26 December 2019 from a minimum altitude of 97,563 km yielding a spatial resolution of 23 km/px.
Starting from Juno's orbit insertion at Jupiter, the JIRAM spectro-imager observed Ganymede over 5000 times, both with its infrared imaging subsystem and with its slit spectrometer sensitive to the 2-5 μm spectral range. This dataset makes Ganymede the most observed Galilean satellite by Juno. Here we discuss the infrared images and spectra that JIRAM was able to acquire in PJ34 and PJ35, with an emphasis on the preliminary spectroscopic results and the distribution of the chemical species detectable in the spectra. These results are important also in preparation for future measurements to be returned by the ESA JUICE mission, which aims to achieve near-global coverage of Ganymede in the 2030s.

Acknowledgements

JIRAM is funded by the Italian Space Agency (ASI), ASI-INAF contract 2016-23-H.0. The JIRAM instrument was built by Selex ES, under the leadership of the Italian National Institute for Astrophysics, Institute for Space Astrophysics and Planetology (INAF-IAPS), Rome, Italy. JIRAM is operated by INAF-IAPS, Rome, Italy. Support of the Juno Science and Operations Teams is gratefully acknowledged.

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