



Jupiter atmosphere in the infrared

Alessandro Mura¹, Alberto Adriani¹, Davide Grassi¹, Alessandra Migliorini¹, Marisa Moriconi²,
Francesca Altieri¹, and the JIRAM TEAM*

¹INAF, IAPS, Rome, Italy (alessandro.mura@inaf.it)

²ISAC, CNR, Rome, Italy

*A full list of authors appears at the end of the abstract

The Jovian InfraRed Auroral Mapper (JIRAM) on board the Juno spacecraft, is equipped with an infrared camera and a spectrometer working in the spectral range 2-5 μm . JIRAM was built to study both the infrared aurora of Jupiter and its atmosphere. The imager observations are used for studying atmospheric dynamical structures, while spectroscopic ones are used for studying atmospheric dynamical structures and for investigating the abundance of some chemical species relevant for the atmosphere's chemistry, microphysics and dynamics, such as water, ammonia, phosphine, germane and arsine.

Since the orbit insertion, JIRAM has performed several observations of the planet from the equator to poles. Unprecedented views of the polar atmospheric structures have been acquired for the 1st time thanks to the unique orbital design of the Juno mission. Spectral measurements provided the opportunity to measure abundances of minor atmospheric species at all latitudes down to pressures of 4-5 bars. Limb observations at the low latitudes permit to probe abundances of methane and trihydrogen cation in the stratosphere and the thermosphere of the planet.

In the north polar region, Juno discovered, in 2016, the presence of a regular eight-cyclone structure around a single polar cyclone; in the south, one polar cyclone is encircled by five circumpolar cyclones. Now, recent observations, performed in late 2019, showed that this configuration has significantly changed: the south structure is now more similar to a hexagon, while in the north there are significant hints that the octagonal shape may have been destroyed.

JIRAM TEAM: Roberto Sordini, Andrea Cicchetti, Raffaella Noschese, Federico Tosi, Christina Plainaki, Gianrico Filacchione, Giuseppe Piccioni