

EGU2020-7318

<https://doi.org/10.5194/egusphere-egu2020-7318>

EGU General Assembly 2020

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Jupiter dayside as seen by JIRAM-Juno: current status and examples of spectral data analysis

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The JIRAM instrument on board of the Juno spacecraft includes a spectrometer that operates in the range 2-5 μm with a spectral resolution of about 15 nm.

The signal measured between 2 and 3.1 μm is due to the scattering of solar photons by aerosols in the daytime Jupiter atmosphere and, as such, it has been partially exploited in [1] to study the structure of "white ovals" vortexes in the southern hemisphere.

This contribution reviews the current status and issues of analysis of JIRAM data in this solar-dominated spectral range, with several examples from different latitudes. Modeling of vertical density profile of clouds is largely based on recent results of [2].

In JIRAM spectra, the region between 2.7 and 3.1 μm does not show any firm evidence of ammonia ice, that would be expected to produce clear spectral features here even when massively coated with contaminants such as tholines. It is therefore difficult to properly model the data assuming the optical properties of aerosols of any given realistic composition.

[1] Sindoni, G., et al. (2017) doi: 10.1002/2017GL072940

[2] Braude, A. S., et al. (2020) doi: 10.1016/j.icarus.2019.113589