P45C-2439 - Average variability in Io's volcanic activity as inferred by Juno/JIRAM

Thursday, 16 December 2021

23:00 - 01:00

Convention Center - Poster Hall, D-F (First)

Abstract

We discuss variations in the Io radiance observed by Juno/JIRAM in its M-band centered at 4.78 μm on a hemispherical scale and over time.
We considered the Io infrared imagery acquired by JIRAM in a four-year period from sequence JM0061 (May 2017) to sequence JM0331 (April 2021). We collapse each Io image into scalar values representative of the mean and median radiance value of its dayside and nightside (geometric quantities associated with each dayside/nightside observation, such as latitude, longitude, phase angle, solar incidence angle, emission angle and local solar time, are also collapsed to their mean and median values).
While dayside data require the application of a comprehensive, pixel-by-pixel photometric correction prior to collapsing each image, in nightside data no photometric correction is needed and the measured signal is dominated by the thermal emission of the volcanic vents, because the effect of Jupitershine, when present, is smaller. We repeat the analysis by using "super-resolution" images, each of which represents the average of several JIRAM acquisitions obtained a few minutes apart, which allows for a higher SNR to be achieved.
We show trends of mean/median radiance as a function of parameters such as mean/median latitude and longitude, as well as mean/median anomaly, to investigate the potential emergence of correlations between average volcanic activity, location of the major eruptive centers, and location of Io along its orbit.

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