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# Variability of Jupiter's stratospheric-auroral heating during the Juno mission, as measured by TEXES

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Jupiter's auroral regions exhibit vibrant mid-infrared (5 to 15 $\mu$m) emission of CH4, which demonstrates that auroral energy propagates as deep as the stratosphere (pressures greater than 1 $\mu$bar) and perturbs the thermal structure. The exact mechanism(s) for this auroral-related heating is/are however not well-understood by the community. The Juno mission and the supporting multi-wavelength ground-based campaign presents a unique opportunity to better understand this stratospheric-auroral phenomenon. We seek to characterize the temporal variability of stratospheric temperatures in Jupiter's auroral regions during this rare opportunity in order to better understand the mechanisms responsible for the auroral-related heating of the stratosphere. Using high-resolution H2 S(1) and CH4 emission spectra measured by TEXES, stratospheric temperatures can be retrieved from 10 mbar to 5 $\mu$bar. Results from previous IRTF-TEXES measurements in December 2014 and April 2016 show the northern auroral region (70°N planetographic, 180°W System III) to exhibit negligible change while the southern auroral region (72°S, 30 – 80°W) showed both an increase of temperature and orientation (Sinclair et al., 2017, in preparation. The evolution will be investigated further, and on shorter timescales of days to months, by using future measurements from IRTF-TEXES in January 2017 and Gemini-TEXES in March 2017. This evolution will subsequently be compared with measurements of X-ray, ultraviolet and near-infrared H3+ auroral emission and Io's volcanic activity to identify any relationships between the stratospheric temperatures and the auroral processes of the ionosphere and external magnetosphere.