Jupiter’s auroral intensifications and their magnetospheric drivers

**Abstract**

Auroral emissions are caused by a wide variety of physical processes. Some of them are common to all planets but others are very specific. As an example, the auroral emissions on Earth are mainly strongly influenced by the interaction of Earth’s magnetosphere with the solar wind, while on Jupiter this interaction is much less important than the processes associated with the giant planet’s fast rotation. The combined effect of varied mechanisms turns out to be extremely complex and proportionally interesting and we only begin to understand it. Simultaneous measurements between polar aurorae and the magnetospheric environments are pivotal in understanding Jupiter’s auroral dynamics, and the contemporaneous measurements recently became regularly available owing to the Hubble Space Telescope’s observing campaigns during Juno’s exploration. We reveal two types of distinct auroral intensifications (localized and global) and the clearly different magnetospheric drivers, suggesting that solar wind and internal processes both participate in driving Jupiter’s aurorae, while showing different morphologies.

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