

Influence of Magnetospheric Plasma on Aurora at Magnetic Footprints of Io

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Io magnetic footprint (IFP) is a result of interaction between Jovian magnetosphere and Io. Due to Jupiter's fast rotation in comparison with Io, magnetospheric plasmas collide with atmospheric particles of Io at high speeds. Therefore the interaction region expands into an extended area behind Io. As a result, aurora spot is extended into a tail-like structure. This research study factors that affect variability of interaction between Jupiter's magnetosphere and Io, which causes the variation of magnetic footprint's brightness for different positions of the Io in Jupiter's magnetosphere. Io's position is indicated by System III longitude. Observations of Io magnetic footprints in this study had been conducted via the Space Telescope Imaging Spectrograph (STIS) and Advanced Camera for Surveys (ACS) instruments along with the Hubble Space Telescope (HST). We compare the magnetic footprint's brightness from observed data with fitted data since 1999 to 2007. This study found that the brightness is controlled by several factors such as the variation of plasma density in the vicinity of Io, the magnetic field asymmetry, including the duration of volcanic eruption on Io.

Summary

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