

Identifying the particle responsible for energy supply during the IPT brightening event.

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HISAKI spacecraft witnessed sudden brightenings of the Io plasma torus (IPT) in EUV spectral range not only for volcanic active period of Io but also for quiet times. Yoshikawa et al., 2016 has reported that the IPT brightens about 10 hours after the auroral brightening event which indicates radially inward energy transport. We have measured the relaxation time of the brightenings appearing between 2013 and 2016. We have also calculated the characteristic time for Coulomb collision with test particles (e^- , H^+ , S^+) in background plasma of IPT condition. By comparing the relaxation time of the brightenings to the characteristic time scale for Coulomb collision, we have determined that electrons supply energy during the brightening events. We also found that ions, which should be transporting to the IPT with electrons, should supply energy but with its low energy supply rate, it could not be observed as brightening.

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