

Solar wind influence on Jupiter's inner magnetosphere found by HISAKI/EXCEED

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The dawn-dusk asymmetry of the Io plasma torus has been seen by several observations. One possible cause of this asymmetry is a dawn-to-dusk electric field in Jupiter's inner magnetosphere. However, the question what physical process can impose such an electric field deep inside the strong magnetosphere still remains. The long-term monitoring of the Io plasma torus is a key observation to answer this question. The extreme ultraviolet (EUV) spectrometer EXCEED onboard the HISAKI satellite was launched in 2013 and observed the Io plasma torus for more than several months. We investigated the temporal variation of the dawn/dusk ratio of EUV brightness. Then we compared it to the solar wind dynamic pressure extrapolated from that observed around Earth by using magnetohydrodynamic (MHD) simulation. As a result we found clear responses of the dawn-dusk asymmetry to rapid increases of the solar wind dynamic pressure. This result agrees with the scenario that a dawn-to-dusk electric field is imposed in the inner-magnetosphere by a field-aligned current.