Juno observations of Jupiter's dawnside magnetopause boundary layer

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Using recent observations obtained by particles and fields instrumentation on the Juno spacecraft, we present the properties of Jupiter's dawnside magnetopause in unprecedented detail. Through magnetic reconnection and viscous mixing (e.g., the Kelvin-Helmholtz instability) processes, Jupiter's dawnside magnetopause provides a pathway for solar wind plasmas to enter the Jovian magnetosphere. On 14 July 2016, we identify an extended magnetopause boundary layer (MPBL) indicative of significant mass transport across the magnetopause. For this event, minimum variance analysis revealed an open magnetopause with a sunward-tilted boundary normal, indicative of significant magnetospheric compression. Furthermore, we identify ~2 h increases in the total magnetospheric pressure adjacent to two magnetopause crossings. These structures are of an order of magnitude longer duration than typical magnetospheric transits (e.g., plasmoids, reconnection fronts) and may provide evidence of focused energy transport into the magnetosphere via magnetohydrodynamic waves.

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