



The absence of a dawn cushion region in Jupiter's outer magnetosphere

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Observations of Jupiter's dayside magnetosphere by the Voyager, Ulysses, and Galileo spacecraft revealed a 'cushion region' in the outer magnetosphere between the magnetodisc and magnetopause. In this region, the magnetic field became predominantly dipolar and the 10-hour periodicity associated with Jupiter's rotation was no longer evident. This 'cushion', unique to Jupiter was proposed to contain flux tubes depleted of mass via magnetic reconnection in Jupiter's magnetotail. The Juno spacecraft sampled Jupiter's magnetosphere along the dawn terminator much more extensively than previous missions, providing focused observations of the local time between the cushion region and predicted source region. We observe a persistent magnetodisc signature beyond >100 Jovian radii, with only modest distortions of the 10-hour periodicity found near the magnetopause boundary. These observations suggest that the dayside cushion is not formed by the loss of mass via magnetic reconnection in the tail but rather may be a natural consequence of the unique geometry of Jupiter's magnetosphere. Juno data provides critical constraints on the formation physics of the cushion region and for the transport of mass and magnetic flux throughout the Jovian magnetosphere.