A32 - Wave activity on Jupiter's magnetopause: dawn and dusk flanks

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Abstract

Jupiter's magnetopause is a highly dynamic boundary shaped by interactions between Jupiter's co-rotating internal plasma and the solar wind, which can drive boundary deformation and wave generation. This study investigates wave activity along the Jovian magnetopause in order to identify the physical mechanisms underlying the observed perturbations.

We applied five boundary analysis techniques to in-situ magnetic field data from seven different spacecraft to estimate local magnetopause normals. These normals were then compared with the probabilistic magnetopause model of Joy et al. (2002) to detect wave activity and determine the propagation direction.

Our results identify waves along the dawn and dusk flanks of the Jovian magnetopause, likely driven by solar wind interactions and possibly associated with Kelvin–Helmholtz instability. Overall, these results suggest that single-spacecraft magnetic field observations can provide statistically robust evidence of wave activity on Jupiter's magnetopause.