



Magnetopause impacts of magnetosheath high-speed jets

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Magnetosheath high-speed jets (HSJs) – dynamic pressure enhancements typically of ~ 1 Earth radius in size – are the most common dayside transient. They impact the magnetopause many times per hour, especially during intervals of low interplanetary magnetic field (IMF) cone-angle. Upon impact they cause large amplitude yet localized magnetopause indentations, and can couple to global dynamics by driving magnetospheric waves that alter radiation belt electron populations. Furthermore, there is plenty of indirect evidence of HSJ association with localized magnetopause reconnection, from remote observations and simulations. Such low latitude reconnections may be relevant for solar wind-magnetosphere coupling since under low IMF cone-angle conditions and without dayside kinetic structures such as HSJs, only high-latitude reconnection is expected. In situ observations, however, have been missing.

We use the THEMIS string-of-pearls configuration to study a two-hour interval with over 9 HSJ magnetopause impacts. First, we analyse the pressure exerted by the jets on the magnetopause and the subsequent magnetopause motion. Second, we investigate the association and effects of the jets on magnetopause reconnection.