



Dawn-dusk asymmetries and sub-Alfvenic flow in the high and low latitude magnetosheath.

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We present the results of a statistical survey of the magnetosheath using four years of Cluster orbital coverage. Moments of the plasma distribution obtained from the electron, ion and magnetic field instruments are used to characterise the flow and density in the magnetosheath. We find that the observed velocity flows and densities show significant differences from the gas-dynamic models. We note two important differences between our survey and the gas-dynamic model predictions: a deceleration of the flow at higher latitudes close to the magnetopause, resulting in sub-Alfvenic flow near the cusp: a dawn-dusk asymmetry with higher velocity magnitudes and lower densities measured on the dusk side of the magnetosheath in the Northern hemisphere with a reverse of this asymmetry observed in the southern hemisphere. High-latitude sub-Alfvenic flow is a necessary condition for reconnection poleward of the cusp.