Kinetic structure of tangential magnetopause current sheets

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Recent observations by Cluster spacecraft have revealed that the magnetic field can rotate across tangential magnetopause current sheets in the form of C- or S-shaped hodograms. Force-free analytical equilibria were suggested to describe such current sheets. Because the Cluster capabilities in measuring particle velocity distribution functions did not allow resolving the particle distribution functions well, it remained unclear what distribution functions should be used in the analytical C- and S-sheet equilibria. In this paper we use better capabilities of particle instruments onboard Magnetospheric Multi-Scale probes to identify the tangential magnetopause current sheets with C-and S-shaped hodograms and investigate the properties of particle distribution functions.