



Cluster new observations of Solar wind plasma entry into the lobes under northward IMF

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An understanding of the transport of solar wind plasma throughout the magnetosphere is one of the most important issues in space science. For geomagnetically quiet periods, however, there is little agreement regarding the type of entry processes that dominate. Moreover, properties in the high-latitude region behind the mid-altitude magnetospheric cusps are poorly understood, partly as a result of lack of coverage by investigative space missions. Here, using satellites of the European Space Agency Cluster mission, which uniquely have sufficient polar orbit coverage and are capable of an unprecedented set of coordinated multi-point measurements, we report the discovery of new solar wind entry regions in the Earth's high-latitude magnetosphere (lobes) tailward of the cusp during quiet periods. From several lines of evidence we propose that these entry regions are most likely produced by magnetic reconnection operating at the high-latitude magnetopause when the interplanetary magnetic field (IMF) is northward. We suggest that these entry regions are significant for solar wind transport into the magnetosphere during such quiet times.