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Cluster/Double Star observations of cusp oscillations

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On March 3, 2004, multiple cusp-like regions were observed consecutively by all four Cluster and Double Star spacecraft. Observational evidence showed that the observed multiple cusps were probably a temporal sequence. The boundary normal, velocity and timing analysis for boundaries of the cusps obtained by all five spacecraft indicate that the observed cusps oscillated back and forth. The normal velocities v_n at boundary interfaces (exit from the cusp) are found to be almost three times as larger as that at boundary interfaces (entry into the cusp). The observations made in this paper suggest the shape and location of the cusp may rarely be static but is often changing as a result of dynamic processes in the high latitude regions. The solar wind azimuthal flow was the controlling factor of the cusp position and was stronger factor than the IMF B$_Y$/B$_Z$ components. The importance of the solar wind azimuthal and north/south flow as a dynamic driver of the cusp, and even the whole magnetosphere has been more or less neglected or underestimated.