



Cluster observations of oxygen ions at the dusk flank magnetopause during variable IMF orientation.

M. F. Marcucci (1), M. B. Bavassano Cattaneo (1), G. Pallochia (1), E. Amata (1), H. Reme (2), I. Dandouras (2), L. Kistler (3), B. Klecker (4), A. Korth (5), and A. Balogh (6)

(1) INAF, (2) CESR/CNRS, (3) University of New Hampshire, (4) MPI, (5) MPA, (6) Imperial College

We present Cluster CIS observations along the dusk flank magnetopause during an outbound orbit on November 20, 2001. Cluster detects magnetospheric oxygen ions both inside the magnetopause and in the adjacent magnetosheath. Oxygen presence lasts for several hours while the spacecraft move from 22 to -2 degree GSM latitude at approximately 19 MLT. A BL is always observed inside the magnetopause where ions of magnetosheath origin flow tailward and slightly southward. In the magnetosphere an almost isotropic O⁺ population is detected. In the BL a tailward flowing lower energy O⁺ population coexists with a high energy O⁺ population. In the magnetosheath, adjacent to the magnetopause: a) the high energy population is depleted but still present b) the lower energy population flows tailward and is depleted whenever the magnetic field turns northward. The oxygen three dimensional distribution functions measured by the three spacecraft are studied in detail and under variable interplanetary magnetic field orientation. The high energy oxygen population crosses the MP because of particle large gyroradius as evidenced comparing the observed distribution functions with the distribution functions computer-generated according the model by Marcucci et al., 2004. The origin of the lower energy population is investigated.