

Project Details

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Project Title:

Solar wind-magnetosphere-ionosphere coupling: Observations during magnetic conjunctions of Cluster with Svalbard

PI Name: Charles Farrugia

PI Email: charlie.farrugia@unh.edu

Affiliation: University of New Hampshire

Summary:

We propose to investigate the coupling of the magnetosphere to the ionosphere (M-I coupling) using observations made during magnetic conjunctions of the Cluster 2 suite of spacecraft with the ground optical site at Svalbard, Norway. Key regions included in these conjunctions are the dayside cusps, the low latitude boundary layer (LLBL), and the near-Earth nightside magnetosphere. With the dayside conjunctions we investigate the signatures in the optical aurora and ionospheric convection resulting from solar wind-magnetosphere interactions at the magnetopause and the LLBL. With the nightside conjunctions we seek to establish links between intensifications of the equatorward branch of the aurora during substorms, related local perturbations in the magnetic field and ionospheric flows, and injections of energetic electrons at the inner edge of the plasma sheet, thereby also furnishing constraints on models. The regulation of M-I coupling by interplanetary parameters is a major thrust of this work. For this investigation we shall employ (1) ACE interplanetary data; (2) the plasma parameters provided by the CIS instrument on Cluster 2; (3) ground-based meridian scanning optical photometers and all-sky imagers; (4) the particle and magnetic field measurements on Polar/HYDRA and MFE, respectively; (5) incoherent and coherent scatter radars; and (6) ground magnetometers. The proposed investigation builds on studies made from this ground site of the dynamics of the optical aurora as a function of interplanetary parameters, and on investigations of magnetosphere-ionosphere coupling during magnetic conjunctions with the Polar spacecraft and the ground optical site.

Publication References:

Summary: "

Reference: Cluster-Svalbard magnetic conjunctions - Farrugia, Charles U NH