



## **Multi-spacecraft Observations of the Dynamics of the Quasi-parallel Bow Shock**

H. Hietala (1), T. V. Laitinen (2), K. Andréová (3), E. K. J. Kilpua (1), A. Vaivads (2), M. André (2), H. E. J. Koskinen (1,3), E. A. Lucek (4), and H. Rème (5)

(1) Department of Physics, University of Helsinki, Helsinki, Finland (heli.hietala@helsinki.fi), (2) Swedish Institute for Space Physics, Uppsala, Sweden, (3) Finnish Meteorological Institute, Helsinki, Finland, (4) The Blackett Laboratory, Imperial College, London, UK, (5) Centre d'Etude Spatiale des Rayonnements, Toulouse, France

On the evening of 17 March 2007, the four Cluster spacecraft were flying very close to the nose of the magnetosphere, slightly on the duskside. At the same time Geotail was approaching the nose of the bow shock, on the dawnside, about  $13 R_e$  away from the Cluster. The solar wind at the time was quite fast, 520-550 km/s, and relatively steady. The position of the quasi-parallel bow shock seen by Geotail matches well to the one given by models for the observed solar wind conditions. However, the magnetopause passed over the Cluster spacecraft several times during a 3 hour period from 17:00 to 20:00 UT. Some of the outward crossings of the magnetopause were followed by short bow shock crossings immediately afterwards. Therefore part of the quasi-parallel bow shock passed through Cluster's location as well. Furthermore, the thickness of the magnetosheath between the successive crossings was observed to be very small, only about  $1.4 R_e$ . We investigate how and why the quasi-parallel bow shock was deformed allowing it to be this close to the magnetopause. We are also using data from the geostationary satellites to detect possible changes in the magnetosphere.