Europlanet N3 activity: Ionosphere-Magnetosphere Coupling of Fast Flows/Flux Ropes in the Earth's Magnetotail

Cluster-Ground-based Coordination Workshop (1)

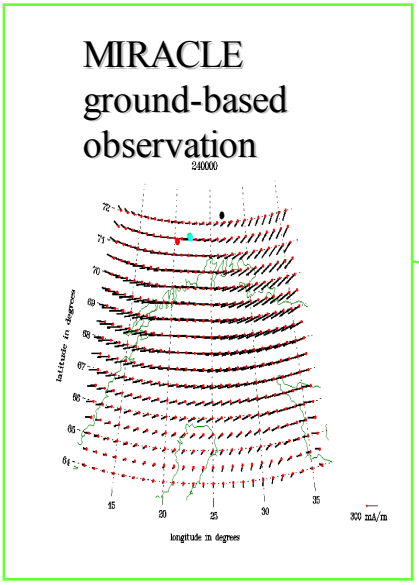
28 August-1 September, 2006 in IWF/Graz

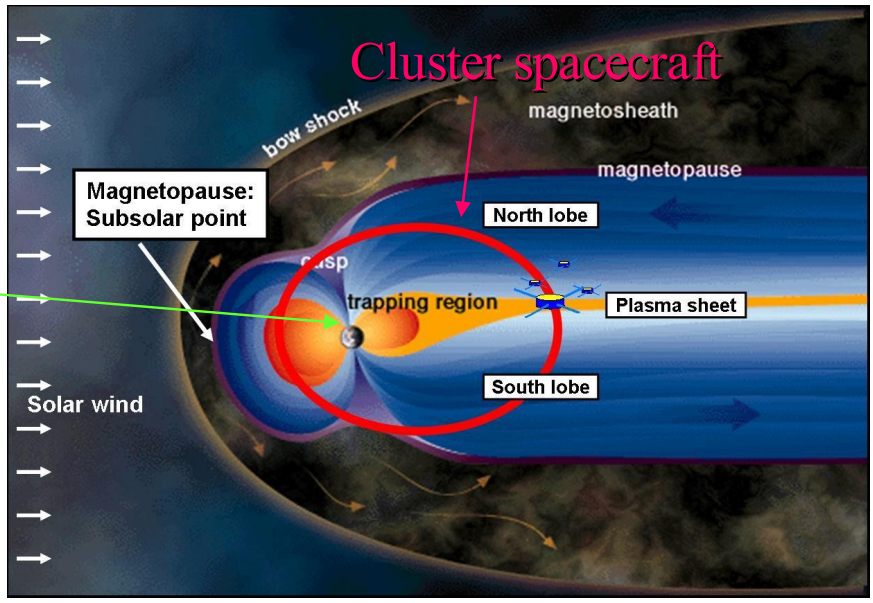
13 Participants from 7 institutions in Austria, Finland, Japan, Norway, U.K., U.S.A.

Research topic:
Ionosphere-magnetosphere coupling of bursty bulk flows/flux ropes and their relevant night-side phenomena

Using data from: Cluster/DSP, MIRACLE, SuperDARN, IMAGE FUV, 210MM, (THEMIS, THEMIS GBO in future)

Coordinated observations



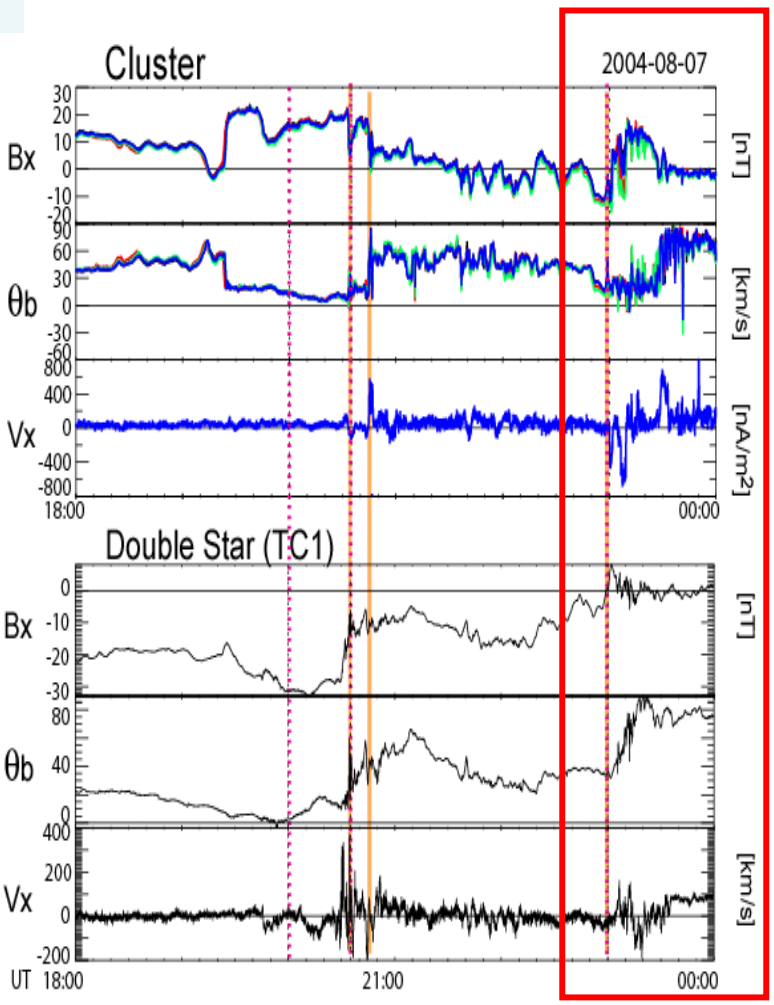


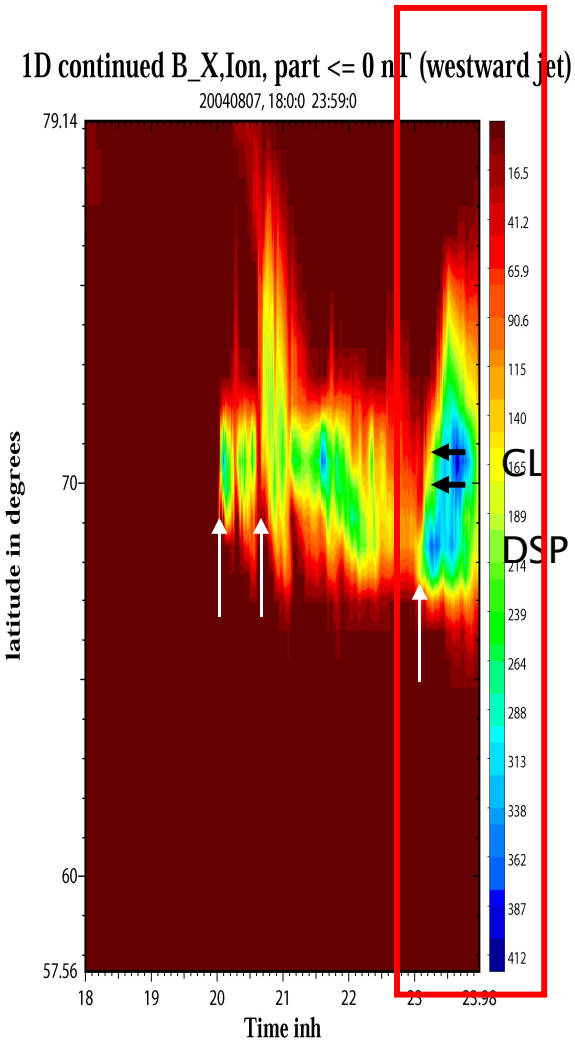
We selected events with good Cluster/MIRACLE conjunction. Observation types can be categorized as below.

1. Fast flows/flux ropes during growth phase/near onset of a substorm
2. Flow phenomena well after electrojet intensification
3. Bursty bulk flow during northward IMF
4. Detailed study of localized/isolated flux rope and BBF
5. PSBL/lobe waves

Example of Cluster–MIRACLE observation

- MIRACLE–Cluster observations along the same field line in the magnetosphere and ionosphere
- Cluster/TC1 observed fast flows in the beginning of ~23 UT substorms.
  Both SC at post midnight.
- MIRACLE observed enhance ionospheric current





Summary

- Coordinated events studies with good conjunction from multi-SC and ground are on-going

- Selected flow/flux rope events cover different condition:
  - Thin/thick plasma sheet
  - Cold dense plasma sheet
  - North/south IMF BZ interval
  - Different phases of substorms

- Target of the further activity:

  Better understanding of the bursty bulk flows/flux ropes
  in a local/large-scale context

- Future meetings planned in U.K. in Feb. 2007