

Suggestion of Magnetospheric Research within ILWS

Z.X.Liu

Center for Space Science and Applied Research,
Chinese Academy of Sciences

1. The Opportunity of Magnetospheric Research before 2010

1.1 The Main Missions of Magnetospheric Research before 2010

(1) Solar: SOHO

(2) Solar Wind

- WIND

- ACE

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(3) Magnetosphere

- GEOTAL ● POLAR ● CLUSTER ● EMAGE
- DOUBLE STAR-1(TC-1),2003
- DOUBLE STAR-2(TC-2),2004
- TWINS (Two Wide-angle Imaging Neutral-atom Spectrometers), 2 S/C ENA imager experiments to be launched in 2004/2005.
- Epop (Enhanced Polar Outflow Probe), to be Launched in 2006
- THEMIS (Time History of Events and Macroscale Interactions during Substorms), 2007
- RAVENS (Recurrent Auroral Visualization of Extended Northern Storms), 2 S/C in polar orbit, 2008
- ORBITALS (Outer Radiation Belt Injection, Transport, Acceleration and Loss Satellite), 2008

1. The Opportunity of Magnetospheric Research before 2010

1.2 To form a multi-sphere, multi-temporal and multi-potential-scale magnetosphere exploration system, including:

- Solar, Solar Wind, Bow shock, Magnetosheath, Magnetopause Boundary Layer, Middle Geotail, Near Earth Geotail, Radiation Belt, Ring current, Plasmasphere, Auroral Region.
- Small scale, Middle scale and Large Scale.

2. Organize Research Campaign

According to the challenging key Science Problems in the magnetosphere field and based on the aforementioned main missions, we suggest to organize the following magnetospheric research campaigns:

2. Organize Research Campaign

2.1 Solar Wind- Bow Shock- Magnetosheath-Magnetopause (SBMM) interactive Processes

- The structure and dynamics of SBMM system;
- The mechanism of transport from solar wind to magnetosphere;
- The influence of SBMM dynamics to the substorms and magnetic storms.

2. Organize Research Campaign

2.2 Multiple Temporal-Spatial-Scale Triggering Processes for the Magnetospheric Space Storms

- Structure variation and dynamics of geotail, including near tail, middle tail and distant tail.
- Dynamical processes of occurrence and evolution of substorms and magnetic storms, such as reconnection, plasma instabilities, acceleration and heating of particles, etc.
- Theory and simulation models of magnetospheric space storms

2. Organize Research Campaign

2.3 Coupled Dynamical Processes between the Magnetosphere and Ionosphere

- The influence of ionospheric up-flowing ions on the magnetospheric dynamics and substorms and storms.
- Electric coupling processes between the magnetosphere and ionosphere during magnetospheric space storms
- Response of ionospheric storms to the magnetospheric space storms.

THANK YOU !