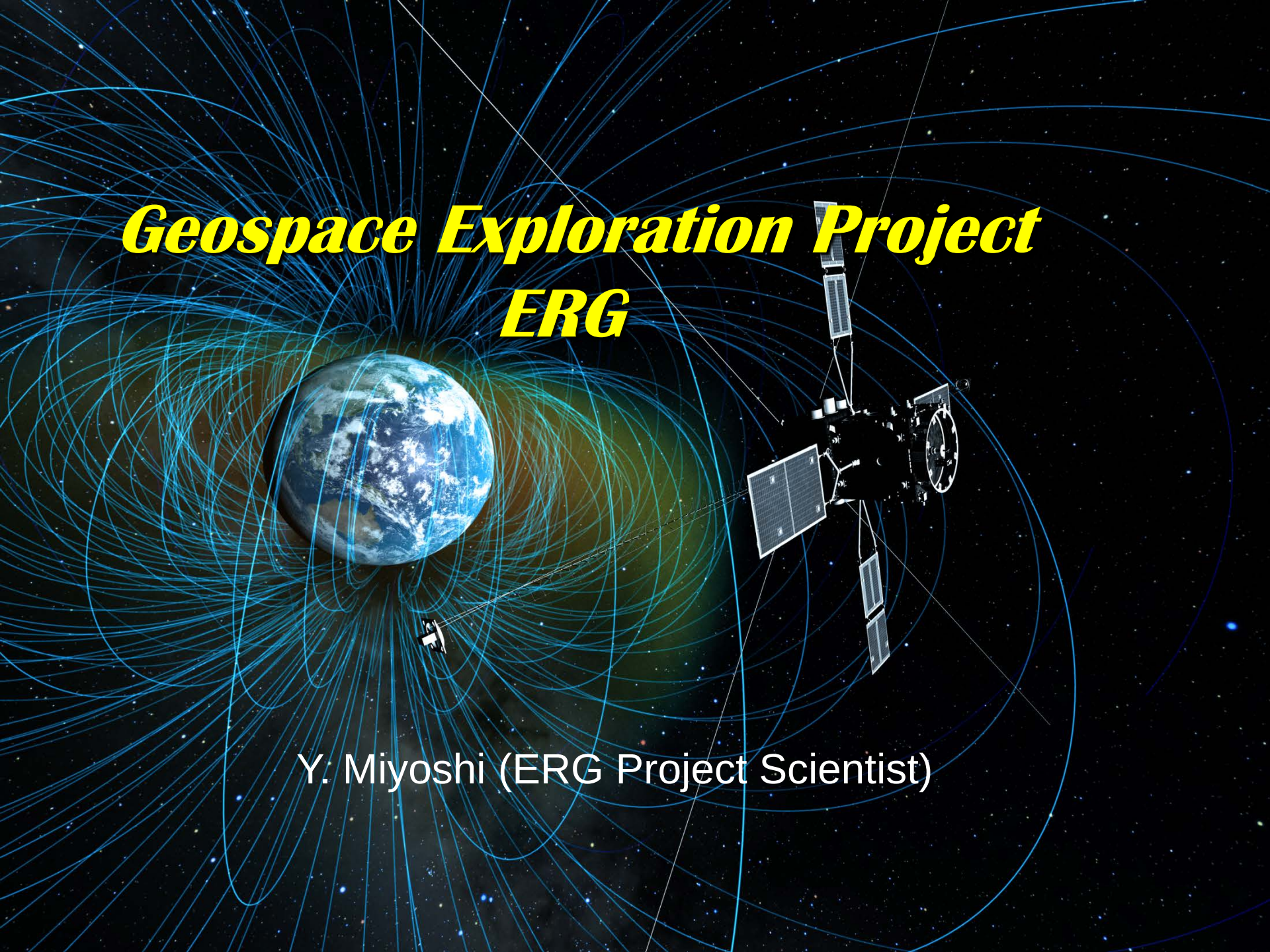
Geospace Exploration Project ERG

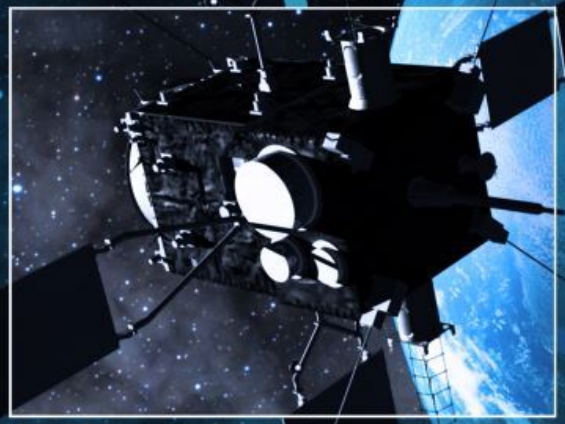


Y. Miyoshi (ERG Project Scientist)

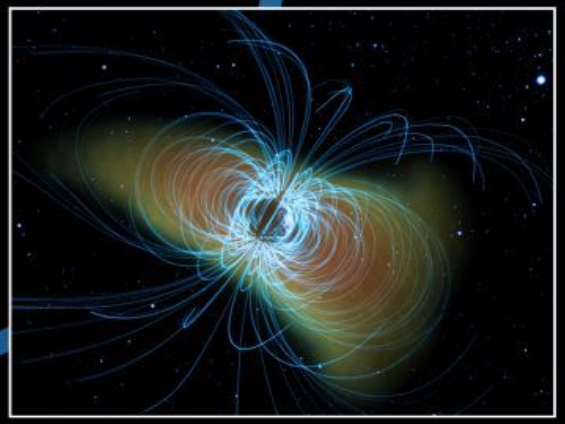
ERG Project Group

Geospace Remote sensing from Ground

ERG Project Team



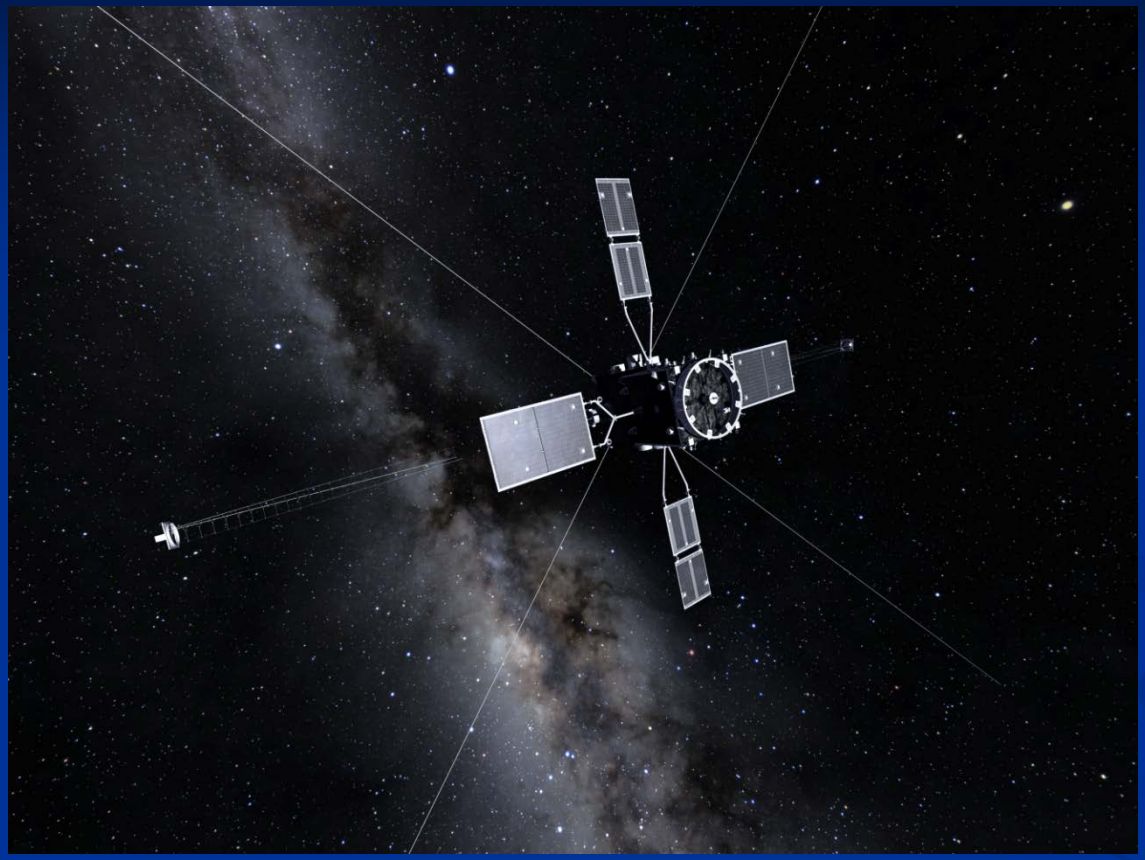
In-situ observations



Simulation/Integrated Studies

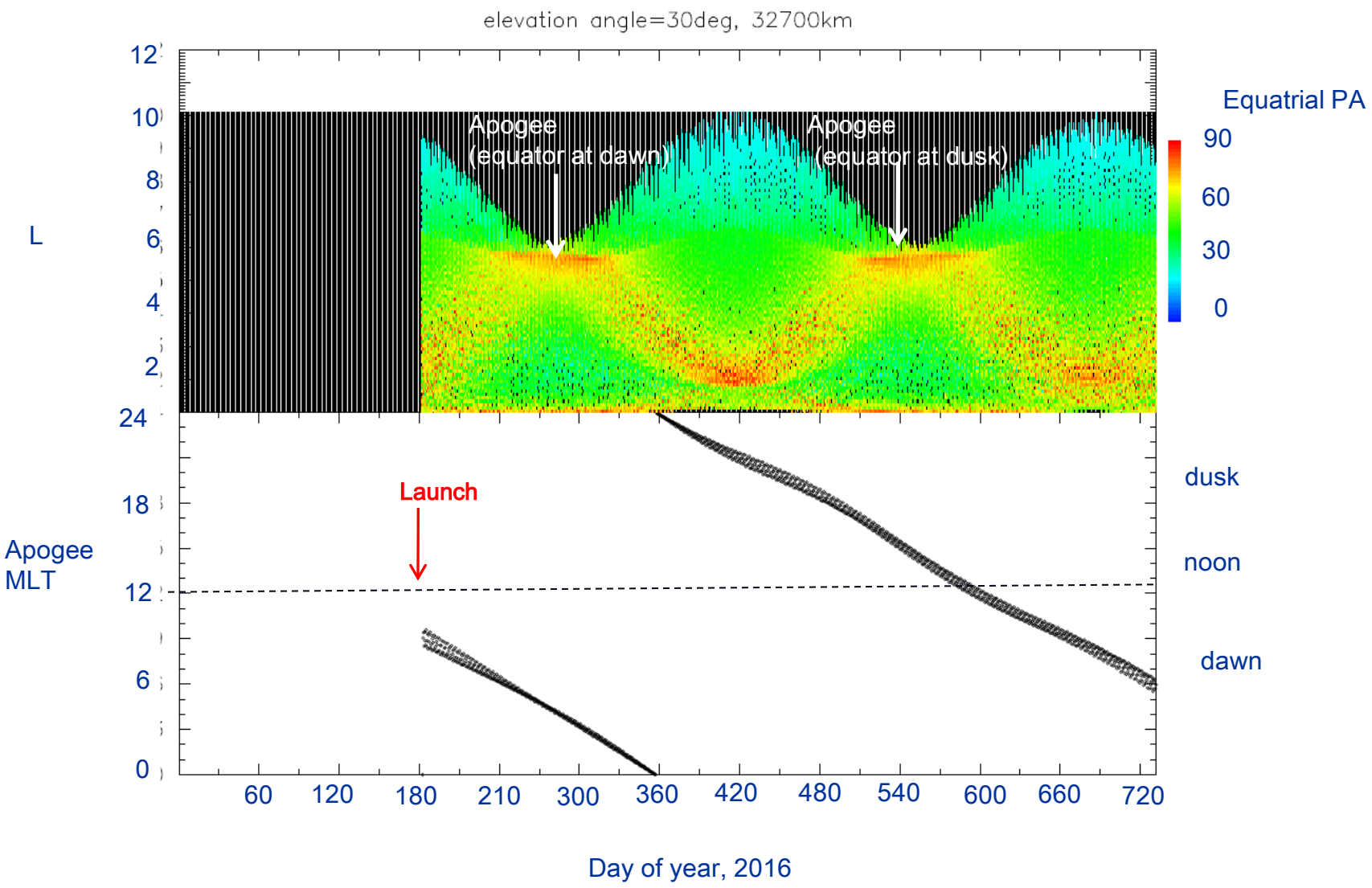
More than 100 researchers are working in the project group.

ERG satellite (ISAS/JAXA)

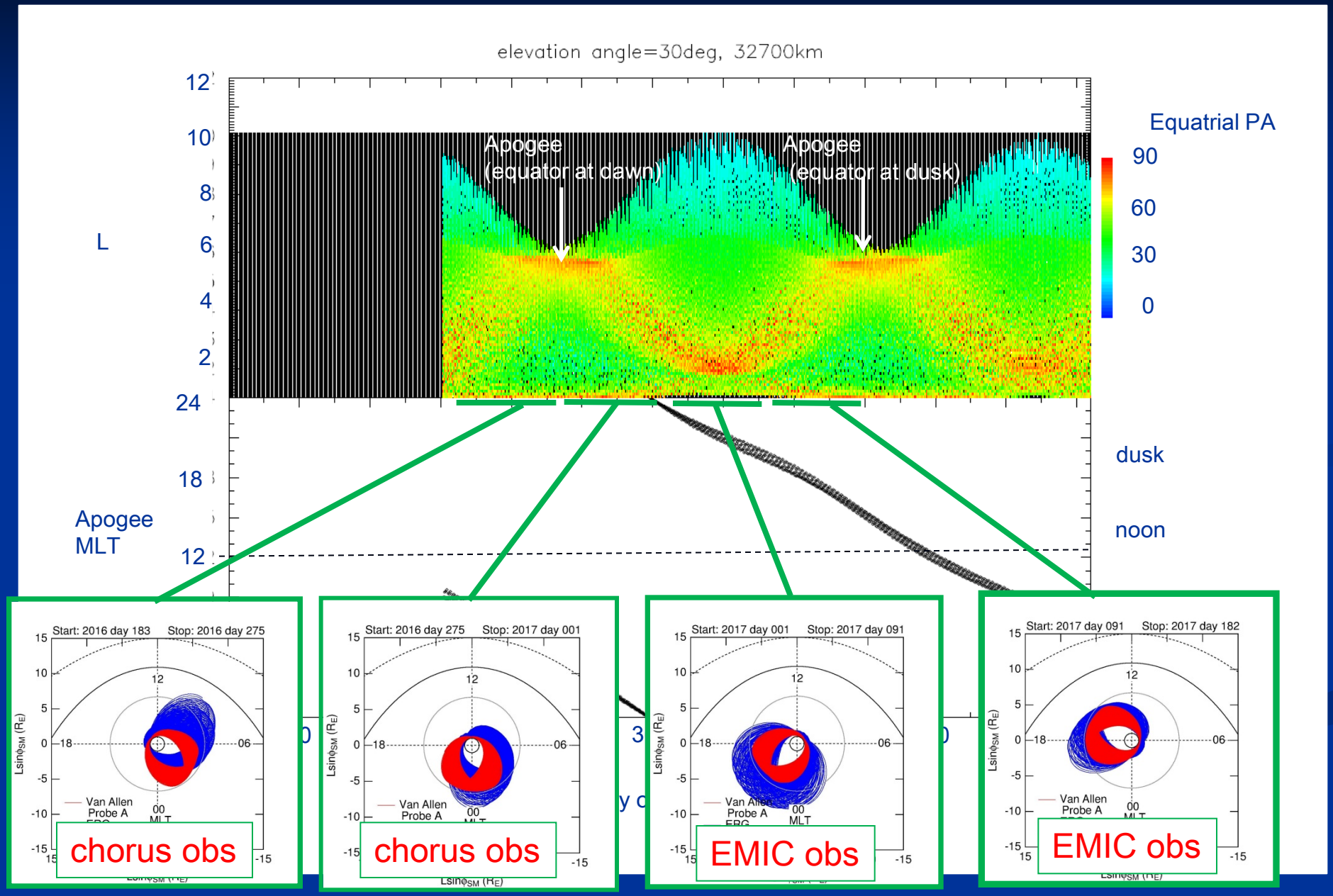


- apogee geocentric distance: 5.5 Re
- perigee altitude: 300 km
- inclination angle: 31 deg (Lmax ~ 9)
- initial apogee MLT: 09:00
- spin period: 8 sec
- planned launch date: 2016 /06-08
- nominal mission life: > 1yr

Planned orbit – MLT and Pitch Angle coverage

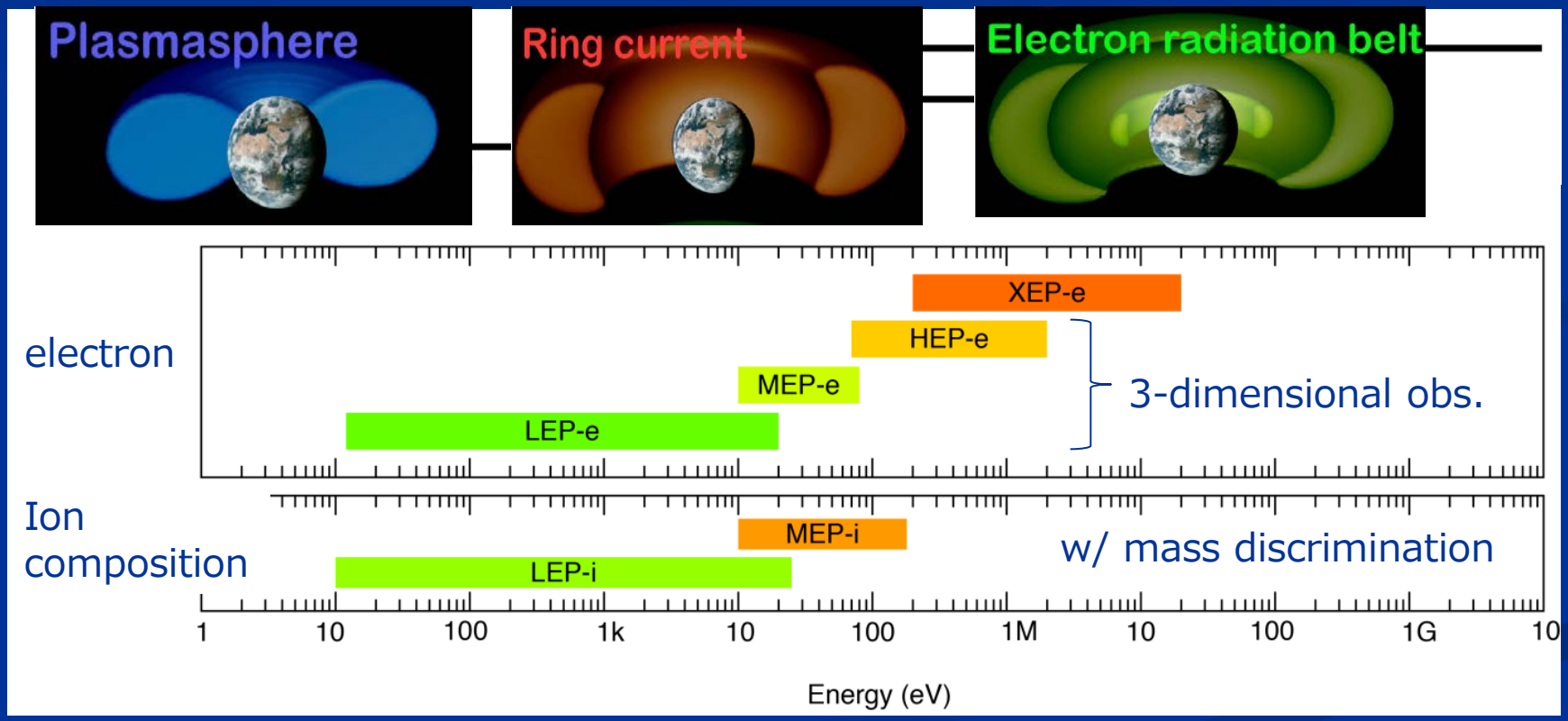


Planned orbit – MLT and Pitch Angle coverage



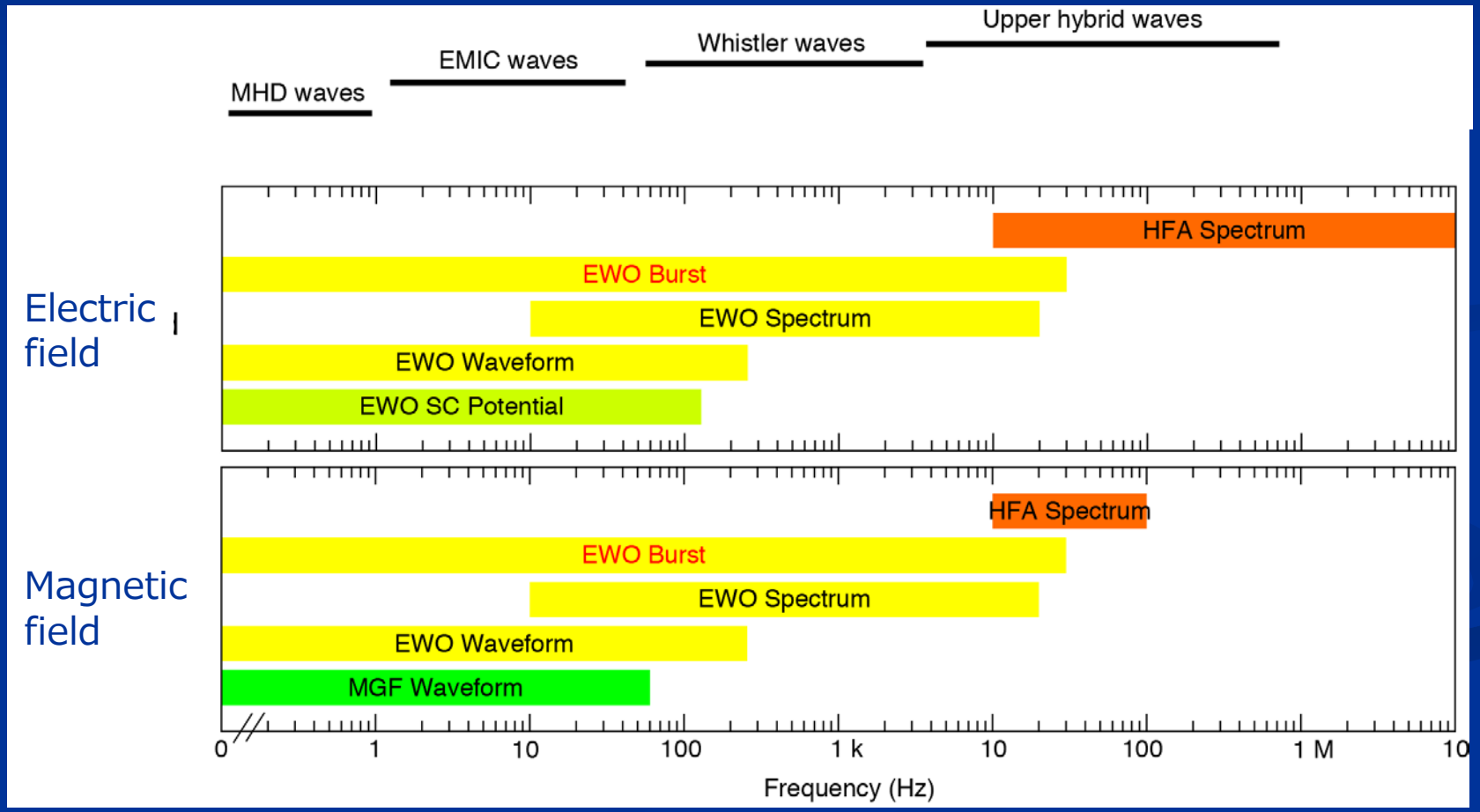
ERG : *plasma & particles*

PPE: Plasma and Particle Experiment Suite



ERG: Field and Waves

PWE: Plasma Wave and Electric Field Experiment
MGF: Magnetic Field measurement



Mission Status & Schedule

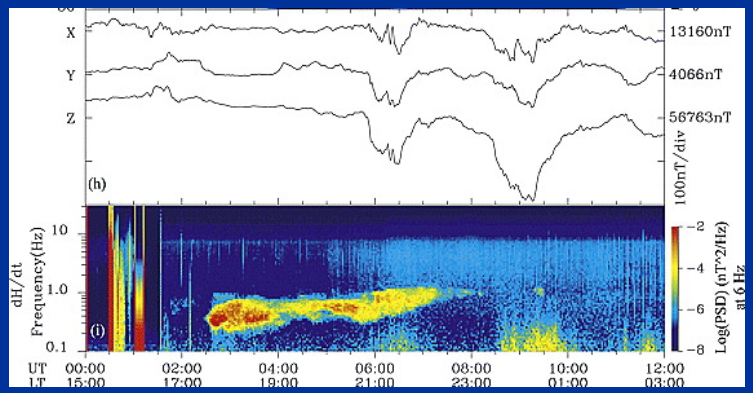
FY 2009	-	Mission Definition Review. System Requirement Review.
FY 2011	-	System Definition Review
FY 2012	-	Preliminary Design Review
FY 2013	-	Critical Design Review
FY 2014	-	Development of the flight model
FY 2015	-	Integration test
FY 2016	-	Launch

The *ERG* ground networks : waves

- **Radar Network:** <u>SuperDARN network</u>

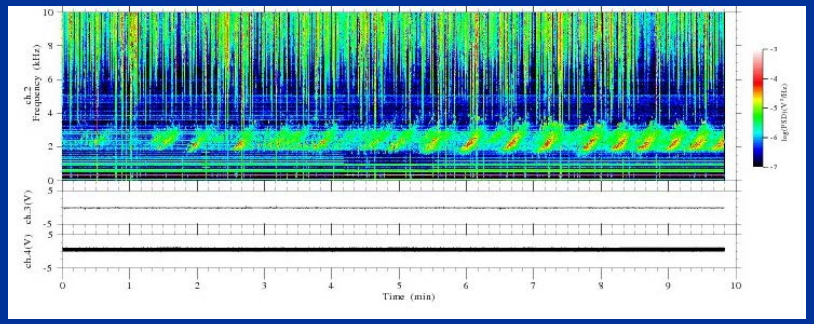
- global convective electric field
- ULF pulsation (Pc5)
- Electric field penetration

- **Magnetometer Network:** <u>MAGDAS/CPMN,210MM Antarctica Network</u>



- ionospheric current /ring current.
- ULF pulsation (Pc5).
- EMIC (Pc1).
- diagnostics of plasmasphere

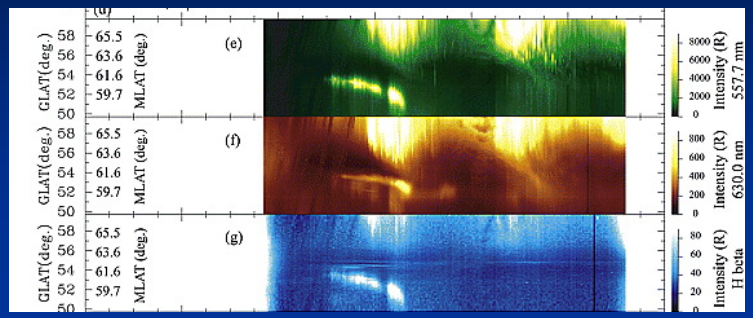
- **VLF Network:** <u>Canada, Antarctica</u>



- whistler (chorus, hiss).

The *ERG* ground networks : precipitation

- **Optical Imager Network**: <u>Canada, Norway, Siberia, Antarctica</u>



-Imaging of precipitation of ~keV electrons/ions.

- **Riometer Observations**: <u>Antarctica/Canada</u>

- Imaging of precipitation of tens keV electrons

- **LF-Radio Wave Network** : <u>Svalbard/Canada</u>

- Monitoring of D-layer disturbance
  Estimation of MeV electron precipitations

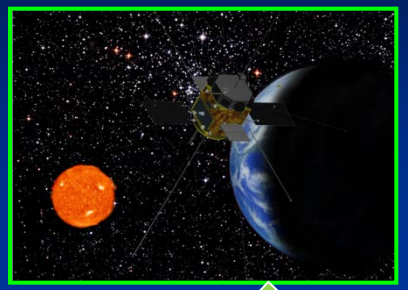
- **Balloon Gamma-ray Observations** : <u>Norway</u>

- Imaging of precipitation of
  tens keV ~ MeV electrons.

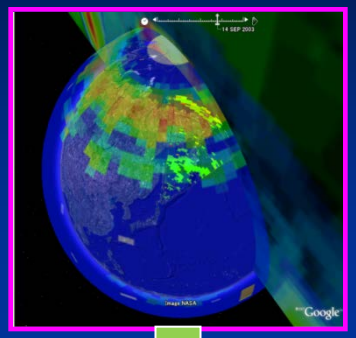
The *ERG* Science Center

Google ERG science center

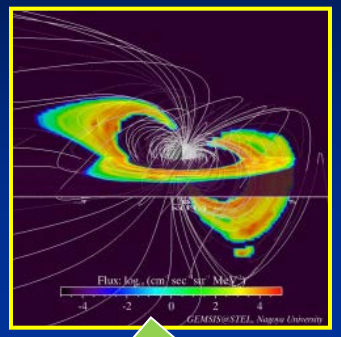
***ERG*-satellite data**



***ERG*-ground data**



***ERG*-modeling data**



ERG–science center

All science data
are archived with CDF

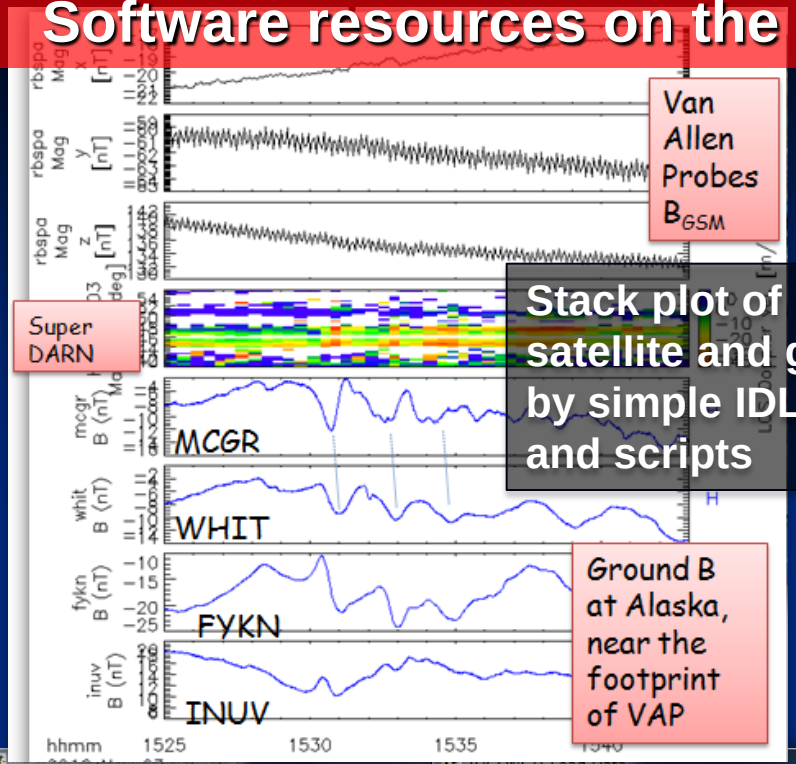
IDL/SPEDAS is a project
data analysis software

SPEDAS v1.0 includes the ERG-plugin tools.
(210MM magnetometer, SuperDARN radars etc)

users

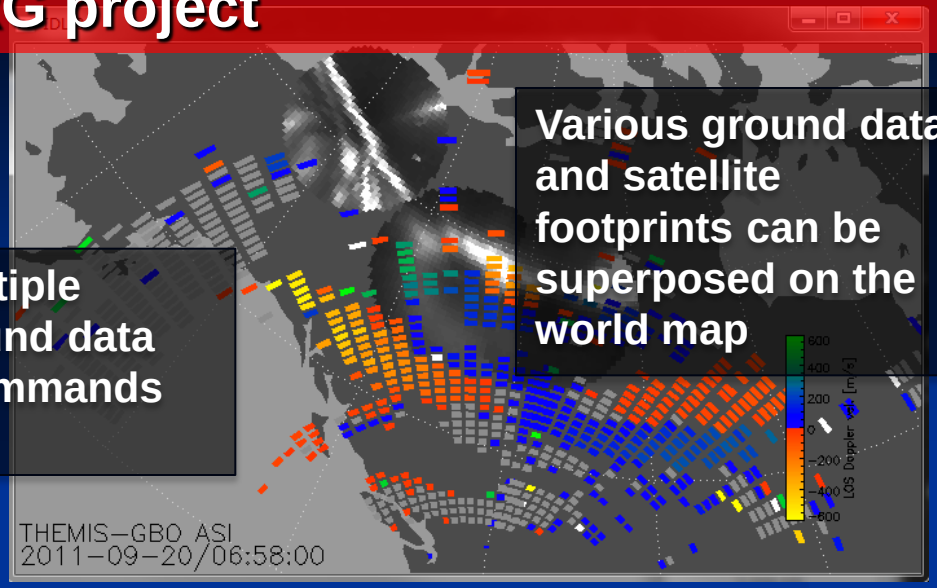
- L-2/3 science data will be opened to the public via ERG-science center.

Software resources on the ERG project

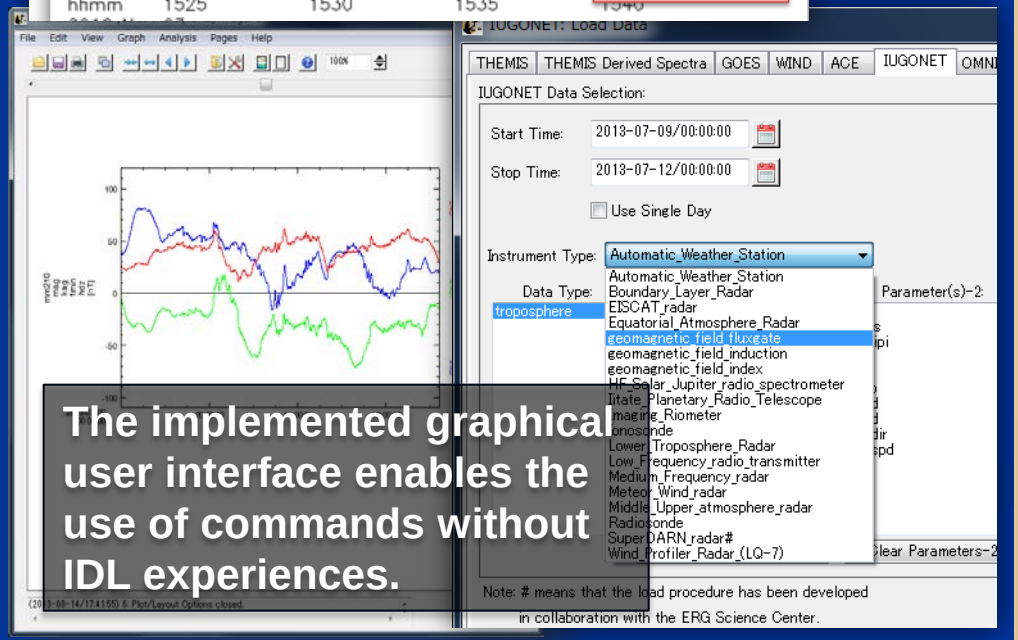


Stack plot of multiple satellite and ground data by simple IDL commands and scripts

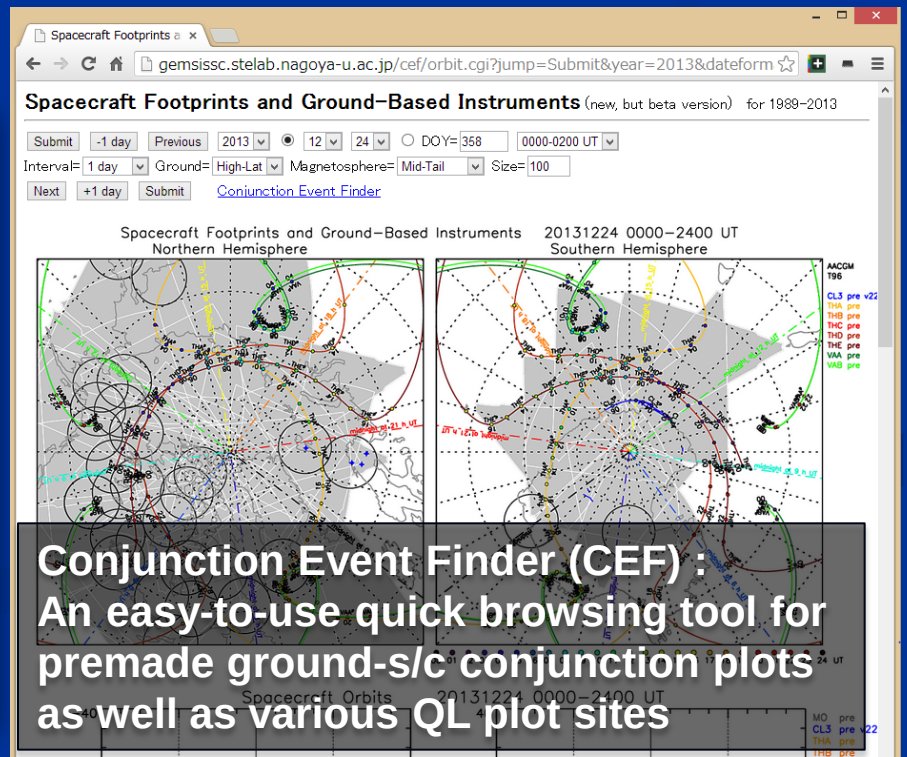
Ground B at Alaska, near the footprint of VAP



Various ground data and satellite footprints can be superposed on the world map



The implemented graphical user interface enables the use of commands without IDL experiences.

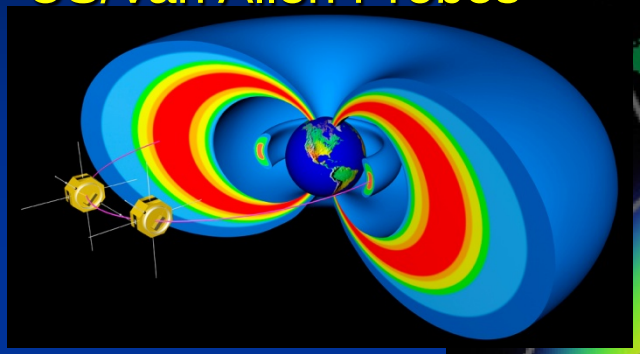


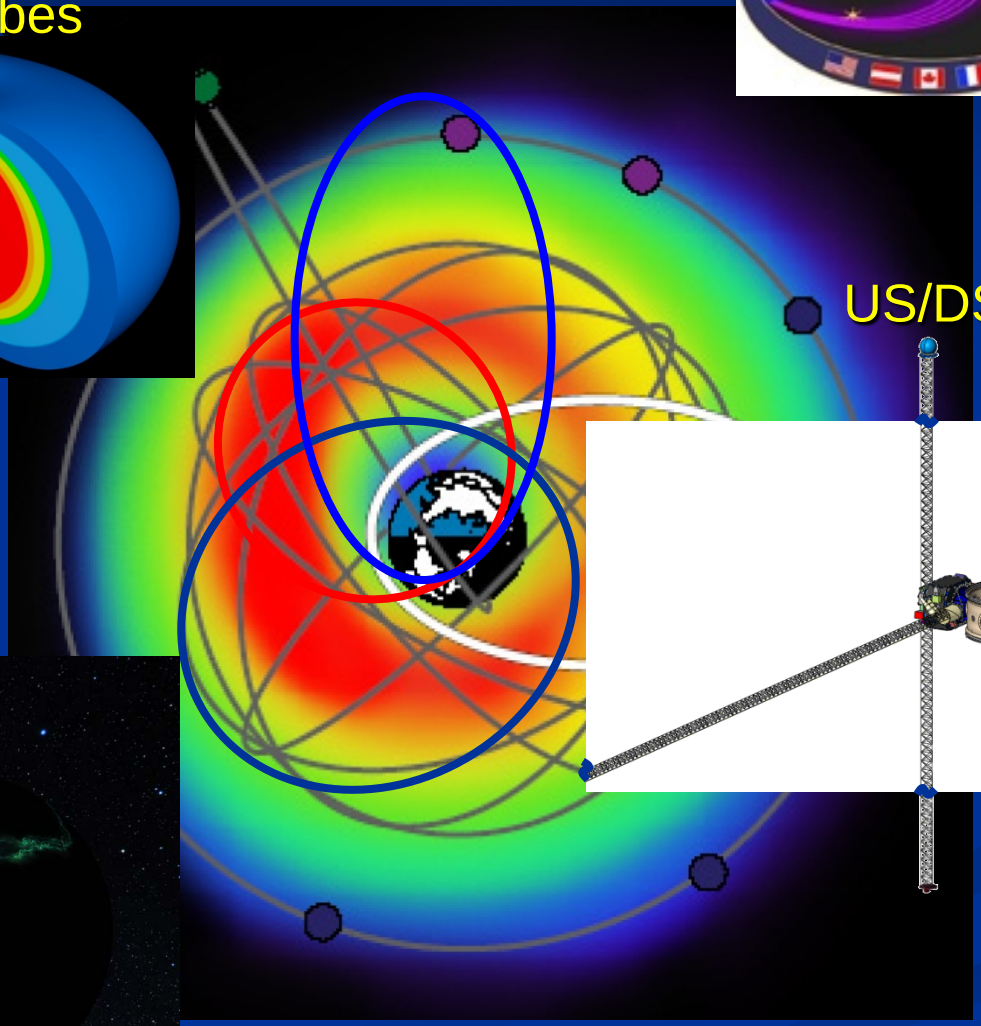
Conjunction Event Finder (CEF) : An easy-to-use quick browsing tool for premade ground-s/c conjunction plots as well as various QL plot sites

3. International Collaboration: A golden era for geospace

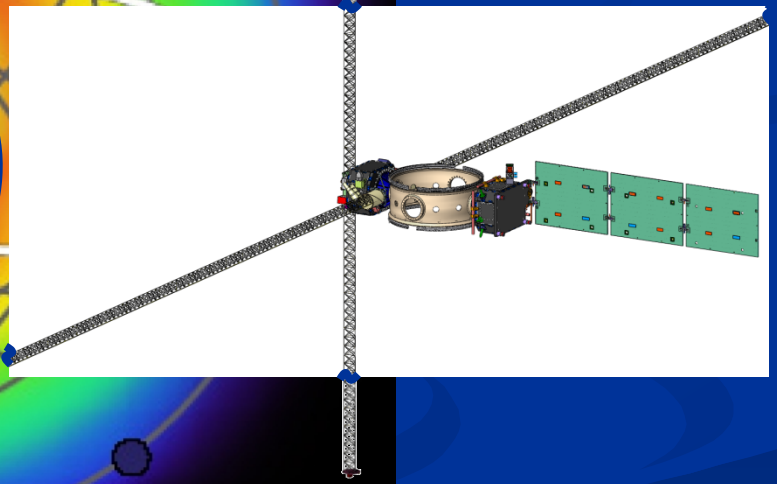
US/THEMIS

US/Van Allen Probes





US/DSX



Japan/*ERG*

Low-altitude satellites
Ground-based observations