Van Allen Probes SWG Telecon
12 June 2015

- Project news
- Van Allen Probes special poster session & data workshop at GEM Summer Workshop
- Publication update
- SOC-Instrument Status Monthly Telecon
- In-person SWG meeting (July 29-31) and Instrument team meetings (July 28) at APL
- Apogee adjustment maneuver
- The analysis of ultra-relativistic electron intensities during March 17, 2015 shock event (Shri Kanekal)
You are scheduled to host this WebEx meeting:

SWG Telecon (Van Allen Probes)
Host: Aleksandr Ukhorskiy

When it's time, start your meeting from here:
https://apl-webex.jhuapl.edu/orion/joinmeeting.do?
ED=rxL3LTnpeocjnuOmjfOehA==&PW=BqAAAAGigzjo0IoPkJ_vpmerrzqxS_iw9bKi-
K5Z2nE8nvVM5flZ36uRM6ct0hMgzsF1O8YMz1GZgpeSpnto_QC4aXRZzk

When: Friday, June 12, 2015, 3:00 pm (2 hrs), Eastern Daylight Time (New York, GMT-04:00).

Access Information
Meeting Number:
999 184 570

Password:
RBSP

Host Key:
384254 (Use this key during the meeting if you ever need to reclaim the host role.)

Audio Connection
8-1000 (Internal)
(240)228-1000 (Washington, DC)
(443)778-1000 (Baltimore, MD)
(844)275-9323 (Toll Free)

Access Code:
999 184 570

The apl-webex.jhuapl.edu team
1) Trending Review July 9, 2015

2) The extended mission tool on the Gateway (http://rbspgw.jhuapl.edu/ExtendedMissionOrbit) were updated to include the predicted Ephemeris (1 year long) for MMS from http://sscweb.gsfc.nasa.gov/cgi-bin/Locator.cgi.
2. A. Saikin “The geomagnetic condition dependence of the spatial distributions of EMIC waves observed by the Van Allen Probes”
4. J. Patterson “ACE/EPAM and Van Allen Probes RBSPICE observations of potential interplanetary oxygen injection into the inner magnetosphere”
5. J. Manweiler “Van Allen Probes Radiation Belt Storm Probes Ion Composition Experiment (RBSPICE) recent results and data access information”
6. J. Manweiler “RBSPICE observations of the March 2015 solar storm”
7. J. Wygant “Recent Science Results from the Van Allen Probes Electric Fields and Waves (EFW) Instrument”
8. K. Genestreli “HOPEful attempts at determining the plasmaspheric temperature”
9. R. Millan “Science Highlights from the BARREL Antarctic Balloon Campaigns”
10. R. Soto-Chavez “RBSPICE Measurements of heavy Ion loss during the 2015 March storm”
11. S. Bounds “The Van Allen Probes EMFISIS Investigation: Overview, Recent Findings, and Data Access”
Publication Update (May 2015)
see attached document

Citation Report: 189
(from All Databases)
You searched for: TOPIC: (Van Allen Probes) OR TOPIC: (RBSP mission) OR TOPIC: (Radiation Belt Storm Probes) OR TOPIC: (Radiation Belt Storm Probe) OR TOPIC: (RBSP spacecraft) OR TOPIC: (Relativistic Electron Storage Ring Embedded) OR TITLE: (Rapid local acceleration of relativistic radiation) OR TITLE: (Unusual stable trapping of ultrarelativistic electrons) OR TITLE: (Discovery of the action of a geophysical synchrotron) OR TITLE: (Direct Observation of Radiation-Belt Electron Acceleration) OR TITLE: (AE9, AP9, and SPM) OR TITLE: (On the storm-time evolution of relativistic electron phase space) OR TITLE: (Impenetrable barrier to ultrarelativistic electrons) OR TOPIC: (EMFISIS) OR TOPIC: (RBSPICE) OR TOPIC: (ETC/REPT) OR TITLE: (EFW) OR TOPIC: (MagEIS)
...Less
This report reflects citations to source items indexed within All Databases.

17 new publications
• Due to numerous travel conflicts (GEM and IUGG) this month’s telecon is cancelled

• We will follow up Monthly Reports and Trending Review presentations with each team individually via email

• Next month’s telecon will be held on **July 17** 3:00 pm EDT
In-Person SWG Meeting at APL

July 28, 2015
Team meetings: ECT, EFW, EMFISIS, RBSPICE
July 29-30, 31 (half day)
SWG Meeting

Doodle poll registration is open (http://doodle.com/dyauhm4yfi7bmamv):
Register by specifying your Name and Organization no later than July 21
*Foreign nationals*: email your citizenship information and the date of birth to ukhorskiy@jhuapl.edu no later than July 17

*wrong: no organization info!*
Preliminary Agenda

May 28 Team Meetings
May 29 Science Presentations
  1) March 17, 2015 storm - the biggest event of the decade
  2) Lapping events
May 30 Planning
  1) Coordination with MMS and planning campaigns with ERG…
  2) New BARREL campaign, Cube Sats
  3) March 17, 2015 storm - the biggest event of the decade
  4) New orbit
May 31 (Half day)
  Wrap-up
**Discussion Questions**

1) Does the presence of NL waves affect the conclusion that QL acceleration suffices?
2) What are the detailed structures and effectiveness of the microphysical processes that act to energize radiation belt particles in the inner magnetosphere?
3) For shock-stimulated acceleration events, what is the relative acceleration by ULF waves extending over hours as compared to that caused more coherently by the initial shock impulse?

**R. Thorne, M. Hudson, D. Malaspina**

4) Which of the following contribute the most to magnetopause losses: MP motion, ULF waves, shell splitting, orbit bifurcation, or ring current inflation?
5) What is the relative importance of the mechanisms that cause precipitation?
6) How important are NL wave interactions in precipitation loss?
7) What is the relative importance of precipitation and MP losses for varying solar cycle conditions?

**D. Sibeck, R. Millan, H. Spence**

8) How do mesoscale injections and global processes transport particles into the ring current, slot, and inner zones?
9) What are the spatial, temporal, energy distributions produced by different transport/injection mechanisms?
10) How do electron and ion injections into the inner magnetosphere affect or modify the global distribution of geoeffective magnetospheric waves?
11) What mechanisms operate at the injection front to convert flow energy into kinetic NL electric field structures?

**M. Gkioulidou, G. Reeves, D. Turner**
Apogee Adjustment Maneuver

*Optimal Time: September 2015; Decision by July 1, 2015*

Expected Nominal EOL: Probe A - May 19 ± 3 months; Probe B - Jun 19 ± 3 months, assuming that the propellant can be saved by optimizing the deorbiting scenario.

**Apogee Maneuver:**
- Decrease Probe A apogee by 140 km, increase Probe B apogee by 140 km
- Execution Sep 15
- Cost 1.3 kg of propellant, which will shorten the mission lifetime by ~ 3 months
- Other scenarios are considered (e.g., 70/70, 70/140)
Microscale Physics

Understanding the role that nonlinear mechanisms play in the acceleration processes.

The maneuver will decrease the interval between the lapping event from 67 to 24 days - x3 more close approach events

Active Investigation of Field-Aligned Effects by Orbital Phase Adjustments

Achieving magnetic conjunctions at close approach

Nominal orbit

Modified Orbit

Δr_{SM}<1000 \text{ km}

ΔL<500 \text{ m}
Mesoscale Physics

How do mesoscale injections and global transport processes act (singly or in combination) to transport electrons and ions into the ring current, slot, and inner zones? What are the spatial, temporal, and energy distributions produced by different transport/injection mechanisms?

Radial propagation and structure of injections

Nominal orbit

Modified Orbit

ΔMLT<1 hr
Jan-Jul, 2017

Sampling rate at the relative separation of ΔL=1.0-1.5 increases by 56% (160 hr/yr)
Sampling rate at the relative separation of ΔL=1.5-2.0 increases by factor of >20 (90 hr/yr)
Between 2012/08/30 and 2015/04/12 there were 47 storms with Dst<-50 nT that produced substantial variability of 4.5 MeV electron intensity.

This corresponds to the average occurrence rate of 1.5 RB storm per month.

Extrapolating into the future, by 2019/4 (79 months total) the Probes will provide two spacecraft measurements of ~118 RB storms.

Shortening the mission lifetime by 3 moths will result in loosing measurements from >5 RB storms (less then 4% of events!).