



The Van Allen Probes

Details of the Radiation Belt Storm Probes Ion Composition Experiment
(RBSPICE)

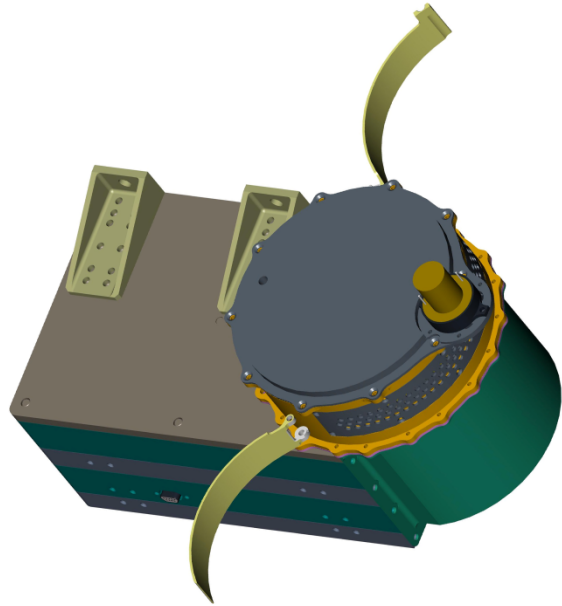
Science Operations Center (SOC)
and Data Products

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3. New Jersey Institute of Technology, Newark, NJ

RBSPICE: Sensor Overview

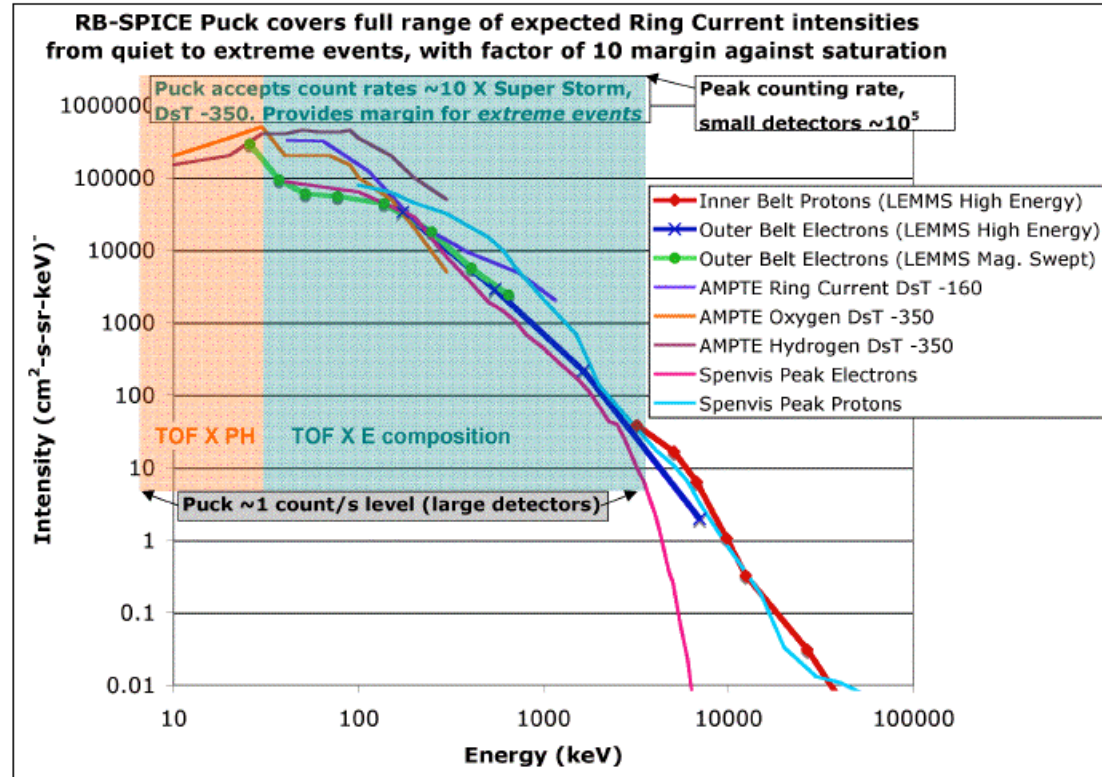
RB-SPIICE: Radiation Belt Storm Probes Ion Composition Experiment



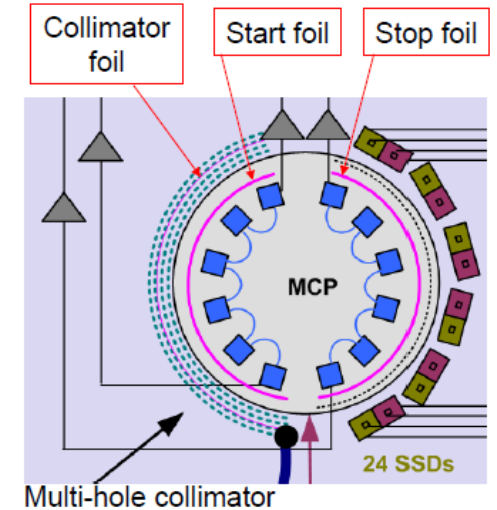
RB-SPIICE Puck

INSTRUMENT OVERVIEW

- **Puck sensor** – ring current ion composition, pitch-angle, and energy sensor



RBSPICE Telescope and Collimator layout



- Measurement quality independent of the angle between the B- Field and the spin axis (α)
- Ion composition energy range low enough to determine complete Ring Current energy density
- High angle and energy resolution provide detailed energy spectra and pitch angle.

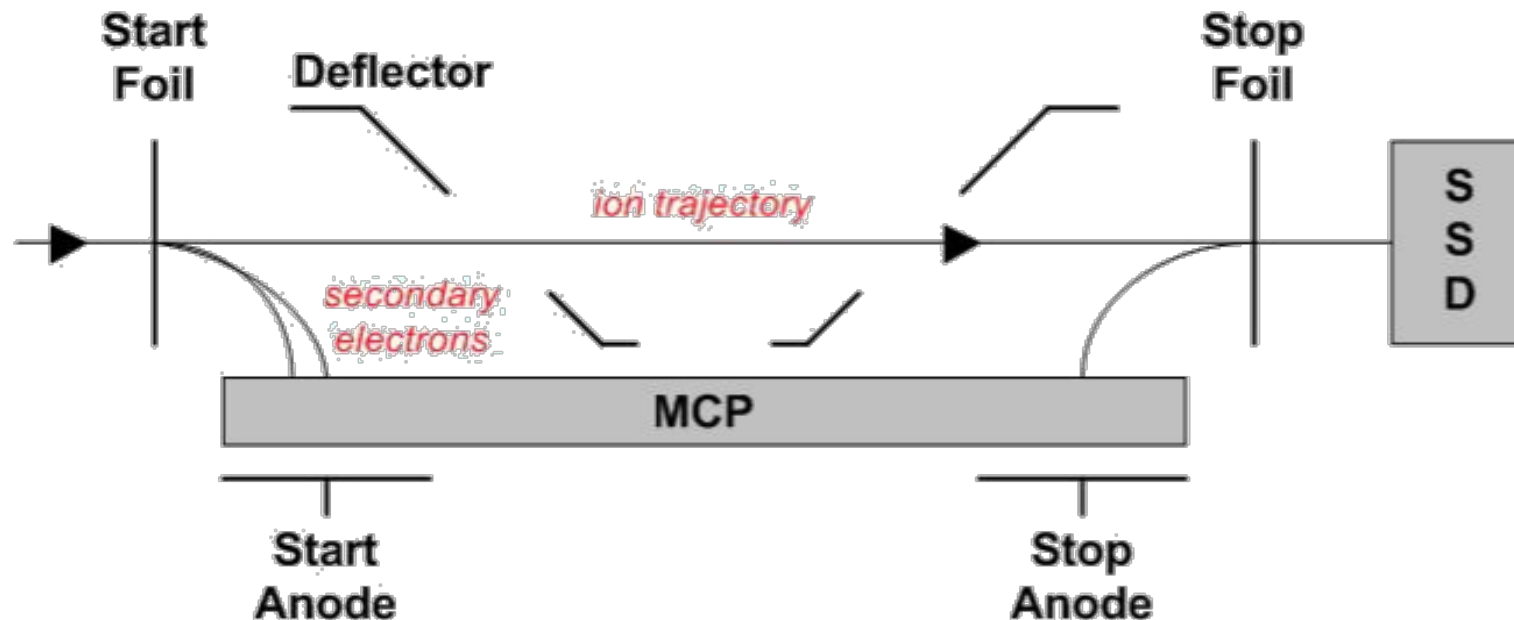
$$\Delta E/E = 0.2; \Delta \theta = 22.5^\circ$$

RBSPICE Sensor Layout

RBSPICE Instrument is comprised of two components:

- 1) Time of Flight System (TOF)
- 2) Solid State Detector (SSD)

- ❑ At lowest energies (which cannot penetrate the SSD surface) particle energy is determined by the TOF
particle species can be identified by the MCP Pulse Height
- ❑ At the highest energies the coupled TOF and SSD system allow for identification of energy and species



RBSPICE High Level Data Products

RBSPICE Data can be found at:

<http://rbspicea.ftecs.com> and <http://rbspiceb.ftecs.com>

The SOC daily produces the following high level data products

Product	Short Name	Species	Energy Bins	L0 Data Type	L1 Data Type	L2 Data Type	L3 Data Type	L4 Data Type
Ion Basic Rate	IBR	Ions	NA	Count	Rate			
Electron Basic Rate	EBR	Electrons	NA	Count	Rate			
Low Energy Resolution High Time Resolution Electron Species Rate	ESR_LEHT	Electrons	14	Count	Spectra	Spectra Flux	PAD, 1st Adiat	
High Energy Resolution Low Time Resolution Electron Species Rate	ESR_HELT	Electrons	64	Count	Spectra	Spectra Flux	PAD, 1st Adiat	
High Energy Resolution Low Time Resolution Ion Species Rate	ISR_HELT	Ions	64	Count	Spectra	Spectra Flux	PAD, 1st Adiat	PSD, 2nd, 3rd Adiat, Pressure
High Energy Resolution Low Time Resolution TOF _x PH Proton Rate	TOF _x PH_H_HELT	Protons	32	Count	Spectra	Spectra Flux	PAD, 1st Adiat	PSD, 2nd, 3rd Adiat, Pressure
TOF _x E Proton Rate	TOF _x E_H	Protons	14	Count	Spectra	Spectra Flux	PAD, 1st Adiat	PSD, 2nd, 3rd Adiat, Pressure
TOF _x E non Proton Rate	TOF _x E_nonH	Heavy Ions	28	Count	Spectra	Spectra Flux	PAD, 1st Adiat	PSD, 2nd, 3rd Adiat, Pressure
Low Resolution High Time Resolution TOF _x PH Proton Rate	TOF _x PH_H_LEHT	Protons	10	Count	Spectra	Spectra Flux	PAD, 1st Adiat	PSD, 2nd, 3rd Adiat, Pressure
TOF _x E Ion Species	TOF _x E_Ion	Ions	64	Count	Spectra	Spectra Flux	PAD, 1st Adiat	PSD, 2nd, 3rd Adiat, Pressure
Space Weather Rates	SW	Ions	NA	Count	Rate	Flux		

Mission Independent Data Layer (MIDL) RBSPICE Visualization Tool

The RBSPICE science team makes use of a tool developed by The Johns Hopkins Applied Physics Laboratory call MIDL (not associated with IDL)

<http://sd-www.jhuapl.edu/rbspice/MIDL/>

MIDL provides visualization of the RBSPICE data

MIDL was developed using the AutoPlot engine(<http://www.autoplot.org/>)

- RBSPICE A and B Daily Plots can be found at:
 - <http://sd-www.jhuapl.edu/rbspice/data/plots/browse/RBSPA/>
 - <http://sd-www.jhuapl.edu/rbspice/data/plots/browse/RBSPB/>
- RBSPICE Interactive Plots can be found at:
 - <http://sd-www.jhuapl.edu/rbspice/data/plotFlipper/rbspicePlot.html>