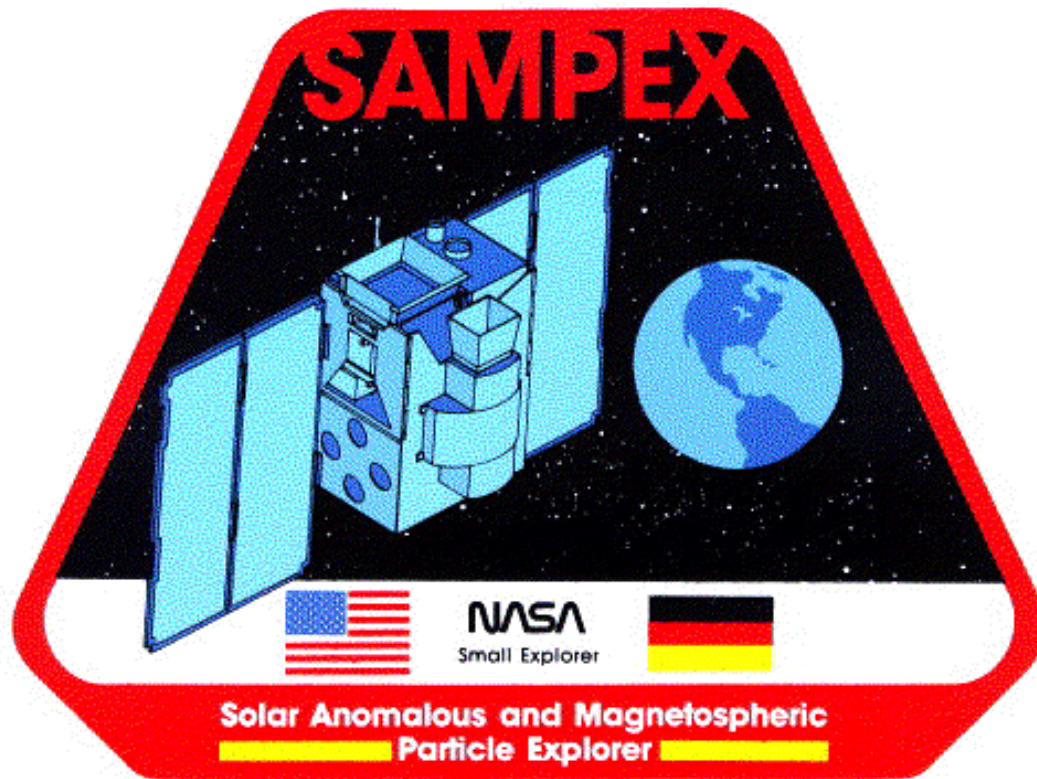


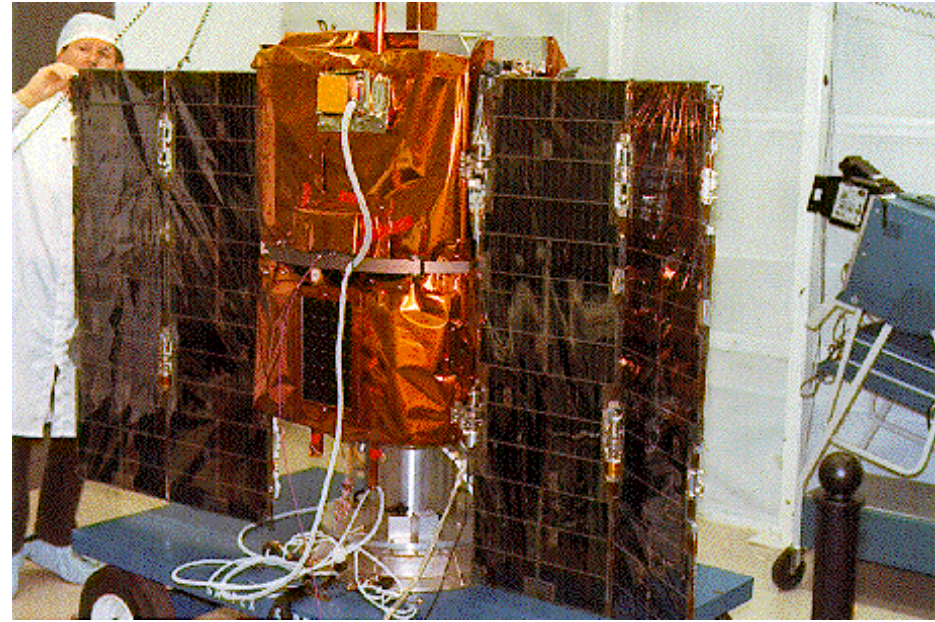
# SAMPEX: 18 Years of Energetic Particle Measurements



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**Laboratory for Atmospheric and Space Physics**  
**University of Colorado, Boulder**

# SAMPEX : Mission Overview

- Launch July 3 1992
- Orbit 82° inclination  
520 by 670 km
- First Small Explorer SMEX  
radiation belts, cosmic rays,  
solar energetic particles ...
- Instruments
  - HILT Heavy Ion large Area Proportional Counter  
Telescope for Solar and Anomalous Cosmic Rays
  - LICA Low Energy Ion Composition Analyzer
  - MAST Mass Spectrometer Telescope for  
Studies of the Isotopic Composition of Solar,  
Anomalous, and Galactic Cosmic Ray Nuclei
  - PET Proton Electron Telescope



# SAMPEX Measurements of Relevance to RBSP

- Long-term, high-quality measurements of relativistic electrons :

PET channels :  $e^-$  2.- 6. MeV

HILT channels :  $e^-$  > 1.0 MeV  
> 3.0 MeV

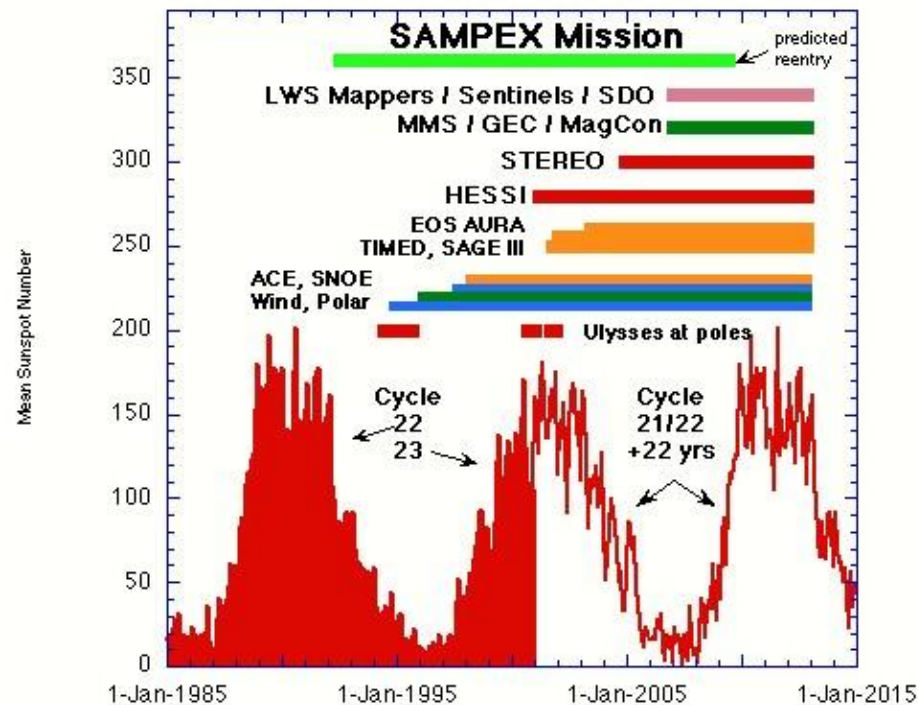
LICA channels :  $e^-$  > 0.6 MeV

- Fast sweep of L shells
- Data availability

PET up to Oct/2009

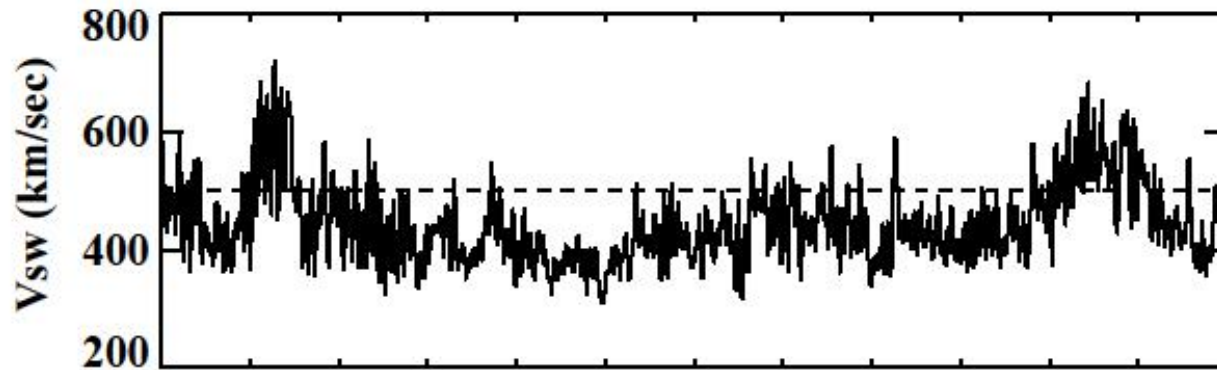
HILT up to present

LICA up to present

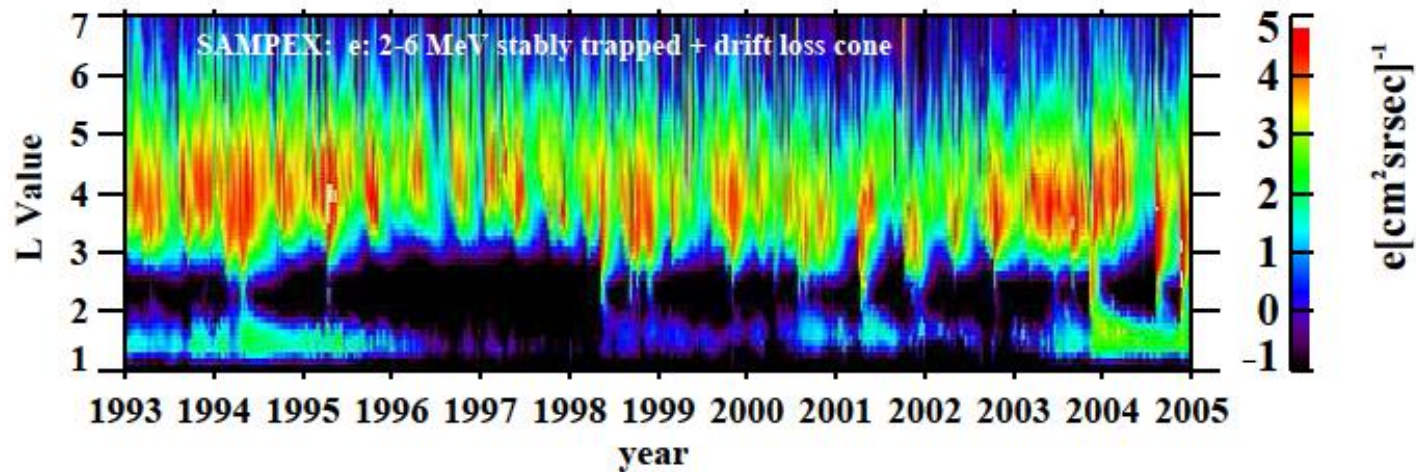




# Solar Cycle View of Radiation Belts



Strong Solar  
Wind Control



# SAMPEX Data Availability

[http://lasp.colorado.edu:8080/sampex\\_jsp/elo-lsort.jsp](http://lasp.colorado.edu:8080/sampex_jsp/elo-lsort.jsp)

SAMPEX  
Sat, Aug 28, 2010 (08:00)

**PET LSORT Data form**  
[All fields are mandatory]

**electron energy channels**

- 2.- 6. MeV
- 3.5 - 16. MeV
- > 3. MeV
- > 1. MeV

**proton energy channels**

- > 4.0 MeV
- 19.0 - 28.0 MeV
- 28.0 - 64.0 MeV
- rng 64.0 - 85.0 MeV

log(flux) minimum   
log(flux) maximum

Year [yyyy]   
Start date doy   
Stop date doy

Submit

These data are not for publication purposes  
Sat, Aug 28, 2010 (08:00)

< Lsort data 1992-2004

The SAMPEX Data Center

**The SAMPEX Data Center**

The goals of the SAMPEX data center are to enable community access by developing an up-to-date flexible web-based system that will facilitate access to SAMPEX data by outside users, and to provide for the eventual permanent archiving of the SAMPEX data set at the NSSDC.

The Solar, Anomalous, Magnetospheric Particle Explorer - SAMPEX - was the first of NASA's Small Explorer (SMEX) series. SAMPEX was launched July 3 1992 into an 82 deg inclination orbit carrying four instruments designed to measure energetic nuclei and electrons over a broad dynamic range. SAMPEX is designed to study energetic particles of solar, interplanetary, and magnetospheric origin, as well as "anomalous" cosmic rays, thought to be accelerated at the solar wind termination shock, and cosmic rays from Galactic sources. While over the geomagnetic poles SAMPEX can measure the interplanetary flux of energetic particles; at lower latitudes it surveys magnetospheric particles over all local times twice a day.

This web site contains from the launch of SAMPEX in July 1992, through the end of the science mission, June 30, 2004.

[Goto the Data!](#)

[Andrew Davis, SAMPEX Data Center Technical Lead](#)

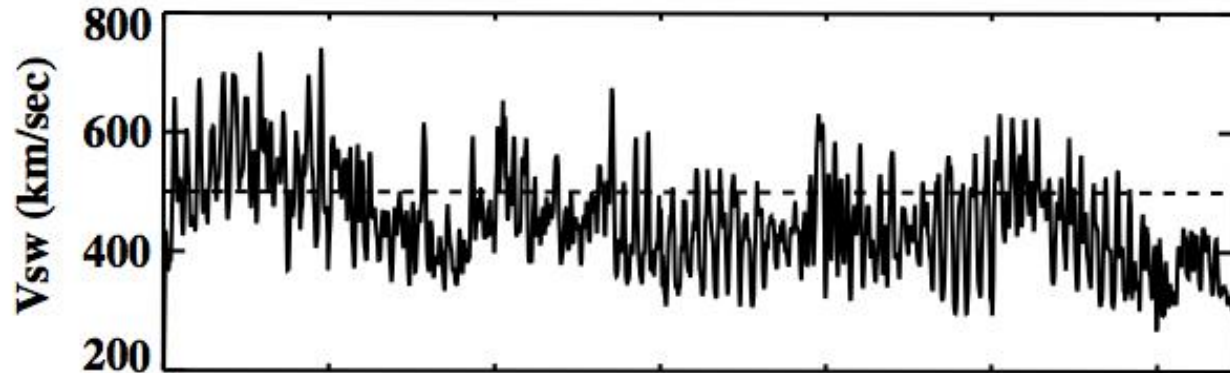
**SAMPEX Data Center Home**  
**What's New?**  
**Online Data**  
**Documentation**  
**People**  
**Related Sites**  
**Bibliography**  
**Gallery**

**Website Stats**

Full dataset 1992-2004 >

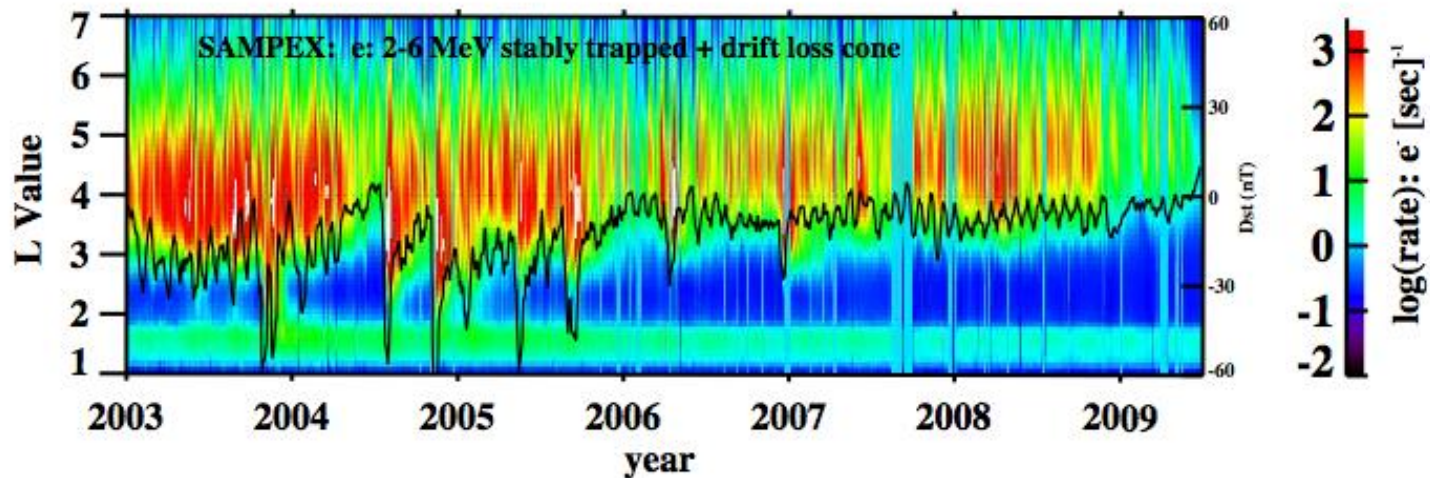
<http://www.srl.caltech.edu/sampex/DataCenter/index.html>

# Extremely Quiet Sun and the Radiation Belts



$$L_{\text{slot}} = A \cdot \exp(\tau/\tau_0)$$

$L_{\text{slot}}$  changes from  
2.8 to 4.0 from  
2007 to 2009



The Van Allen radiation belts have very recently attained their most reduced, quiescent state in the observational record.

# SAMPEX Data Processing : Current Status

Downlinked data processed at Aerospace on VAX/Alpha workstation to produce level-0 data (MDF : Tennis format developed at CalTech)

Further processing to produce FORTRAN readable files (GDF) on a VAX/Alpha (SAMPEX SOC) currently at LASP

- Major issues connecting to internet and setting up FTP have been solved
- Fortran code has to be compiled at Aerospace and FTPed to LASP !
- Heroic efforts by Mark Looper and Shri Kanekal
- Thanks also to Joe Mazur
- Currently 2008 and 2009 data have been processed

Level-1 data production currently underway at LASP

- L sorted daily averaged fluxes corrected for dead time, misidentification