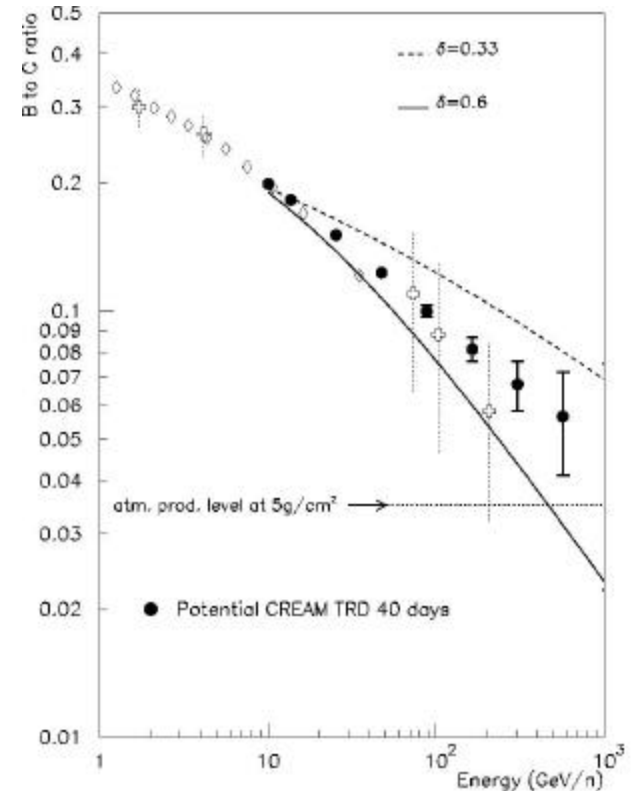
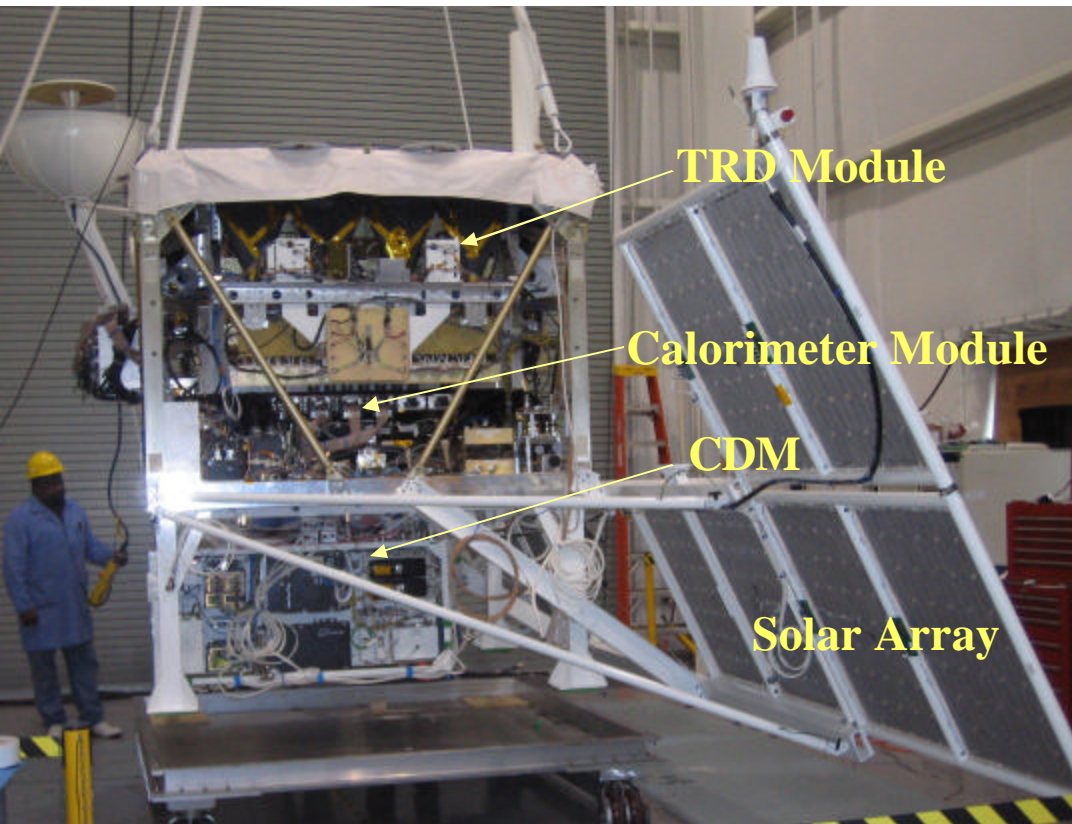


- CREAM can measure individual energy spectra and elemental composition of cosmic rays ($1 \leq Z \leq 26$ and above) from **1 TeV up to 1000 TeV**
- search for a cutoff in the proton spectrum around 100 TeV
- expected to **reach 500 TeV** with 30% statistical accuracy with 3 flights
- **measurement of B/C** ratio up to **500 GeV/n** (test of propagation models)

Cosmic Ray Energetics And Mass



What is the history of cosmic rays in the Galaxy ?



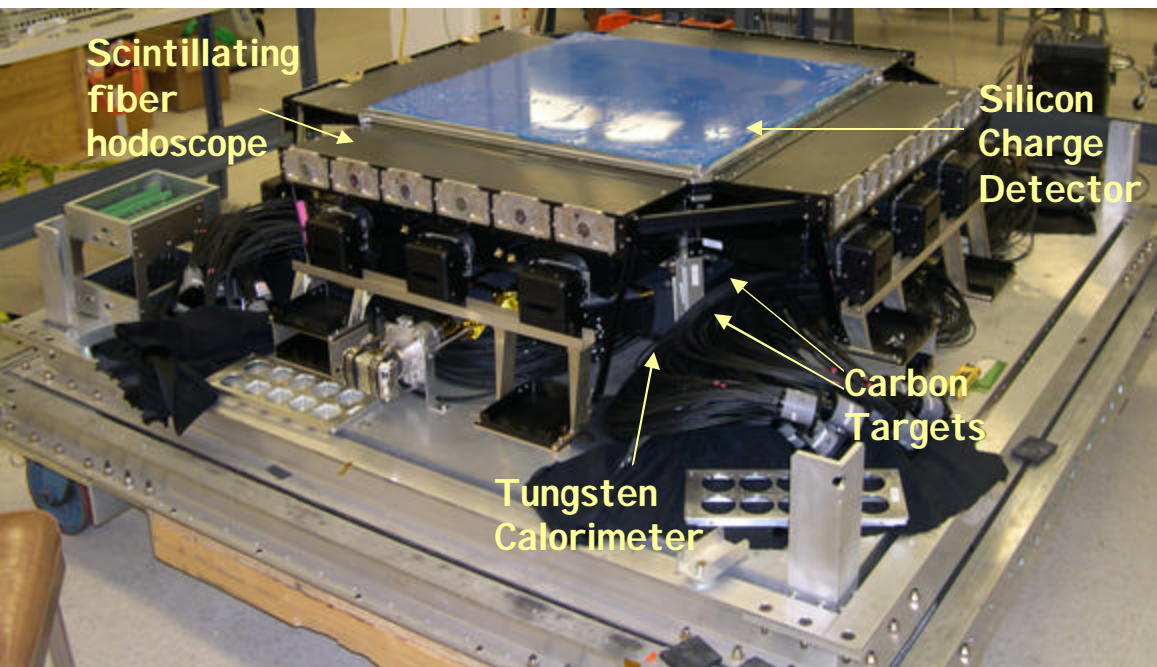
TRD Module

- The **Timing Charge Detector (TCD)** provides event trigger and particle charge identification. The TCD has 2 layers of 4 paddles each.
- The **Transition Radiation Detector (TRD)** has 2 modules separated by a Cherenkov threshold counter

TRD Science Objectives

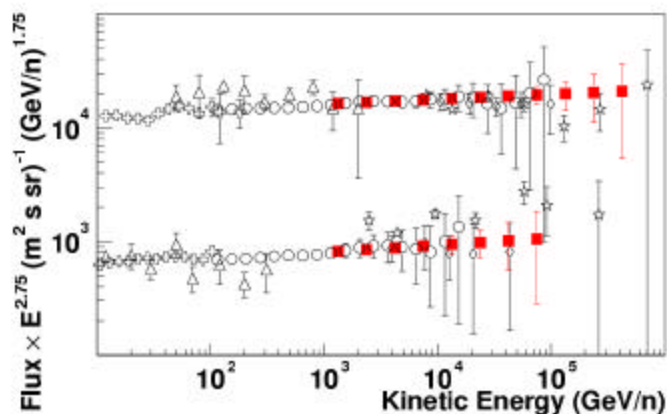
- The above figure compares TRD data expected from a 40-day flight (black circles) with prior data
- The TRD is expected to provide the first **B/C ratio** in this energy range in more than a decade

Exploring Supernova Acceleration Limit



Calorimeter Module

- The **Silicon Charge Detector (SCD)** provides particle charge identification
- The 20-layer **tungsten-scintillating fiber calorimeter** provides its own event trigger and x,y,z tracking coordinates
- The **scintillating fiber hodoscope** provides x,y tracking coordinates at fixed z above the calorimeter



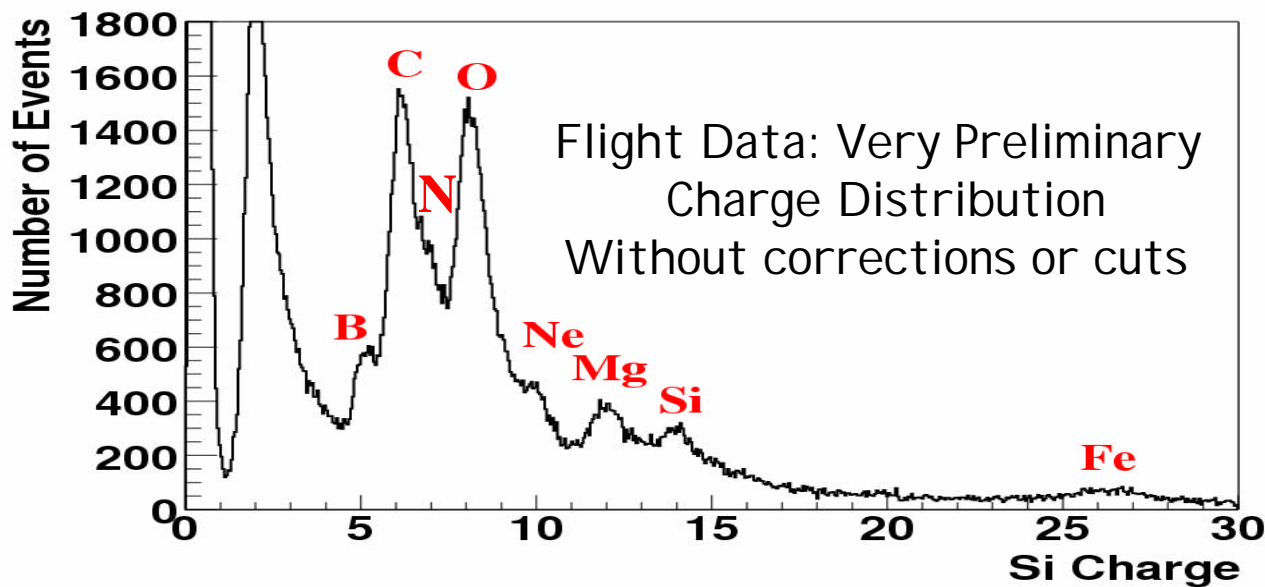
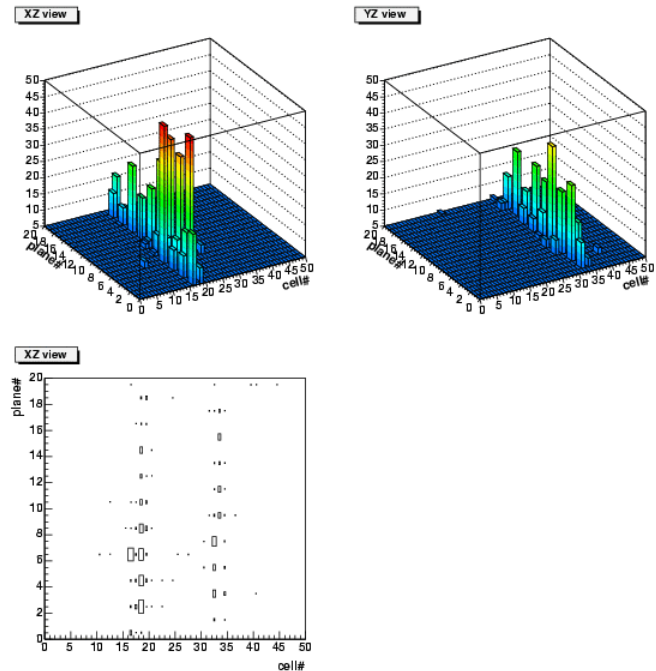
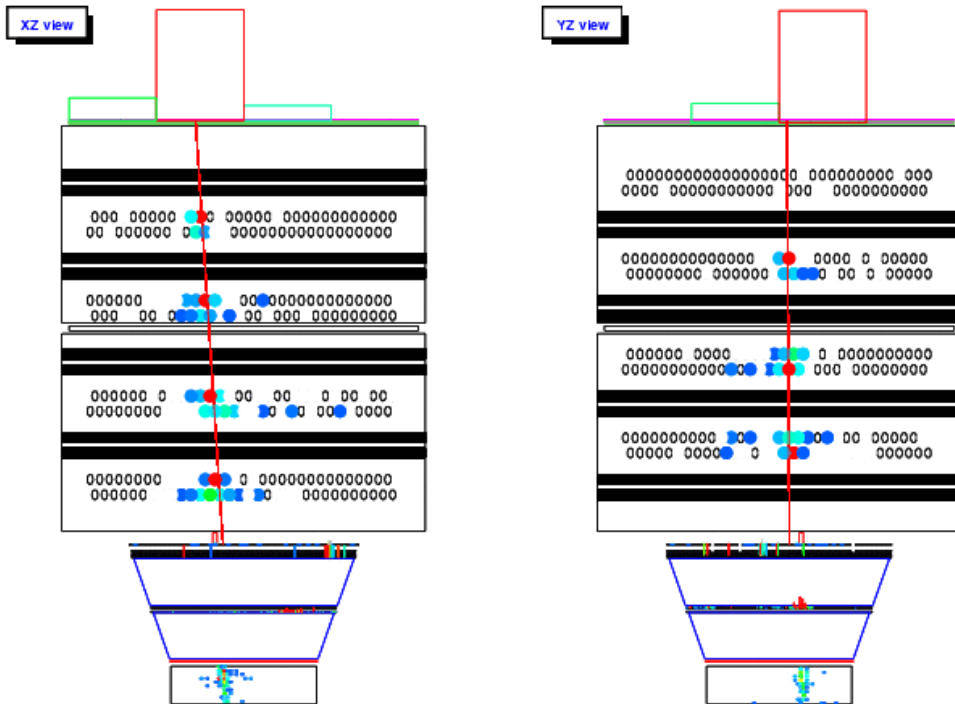
Comparison of Calorimeter data (red squares) for protons (upper) and Helium (lower) with prior data

Calorimeter Science Objectives

- The Figure at left shows unique **p** and **He** results (which TRD can't provide) **expected from a 40-day flight** of the Calorimeter
- Simultaneous measurements of $Z > 3$ particles provides inflight cross calibration of Calorimeter and TRD

An example event: ~10 TeV Fe

20041221-064208.dat - Event 1480073



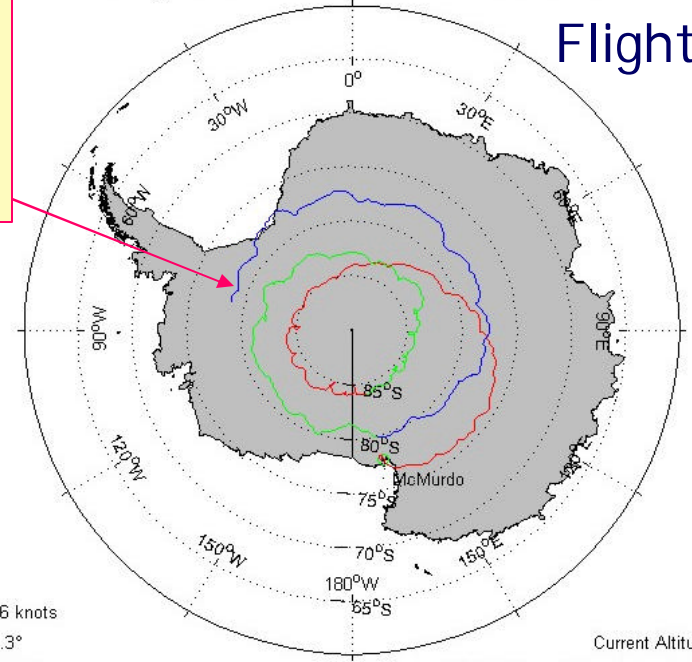
Launch operations



January 16, 2005
Break the record
of 31 days and 20
hrs

CREAM Flight Data: Trajectory
Covering period from: 2004-12-15 23:22:56 to 2005-01-17 21:34:34

Flight 2004



Current Speed: 12.46 knots
Current Course: 253.3°
Current Lat: -78°44'16.2"
Current Lon: -76°17'0.96"

Current Altitude: 129643.7008 feet
Current MET: 32 days 17 hrs 5 mins 33.683 sec since launch
Current Time: 2005-01-17 21:34:34 UT