Firefly

Studying the Earth’s most powerful natural particle accelerator

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Firefly team
GRD development

Prototyping the detection electronics
Testing the GRD front-end electronics
GSE SW for configuring instrument
Characterizing High Voltage Power Supply
Firefly Science

- Are TGFs produced only in association with lightning?
- What kinds of lightning do and do not produce TGFs (polarity, peak current, stroke geometry, charge transferred, presence / absence of sprites and other Transient Luminous Events)?
- What are the fluxes of energetic electrons (100 keV to 10 MeV) accelerated over lightning?
- What is the relative timing of the optical, VLF, electron, and gamma-ray signatures associated with TGFs and what does this imply about the acceleration mechanism?
- What are the spatial extents of the gamma-ray and electron emissions?
- What is the occurrence frequency of very weak TGFs?
Firefly Status

• Delivery date to PPOD integration: May 1, 2010
• Ride TBD, currently in discussions with Space Station for September 2010
• Flight Software 95% complete
• Current Firefly work
  • Assembly and testing of ETU experiment power regulator
  • Testing of VLF / photometer board
  • Fabrication of photodiode collimators and top deck
  • Fabrication of gravity gradient boom
  • Clyde Space started assembly of solar panels and EPS / batteries
  • GPS patch antenna fabrication and tuning underway
  • GRD prototype under test
  • Experiment Controller board schematic 80% complete - firmware development underway
Remaining issues

• Licensing / Ground Station:
  underway, expect NTIA application December

• Experiment / Spacecraft interface:
  first playdate late January 2010

• Scintillator fabrication:
  GEANT modeling complete, mechanical design
  nearly complete, expect finished scintillator end of
  Feb 2010

• GRD testing:
  1.7 MeV electron beam at GSFC in Dec / Jan