Fermi

Gamma-ray Space Telescope

Users Group Meeting
6 February 2009

Mission Status Update (since the phonecall) and Issues

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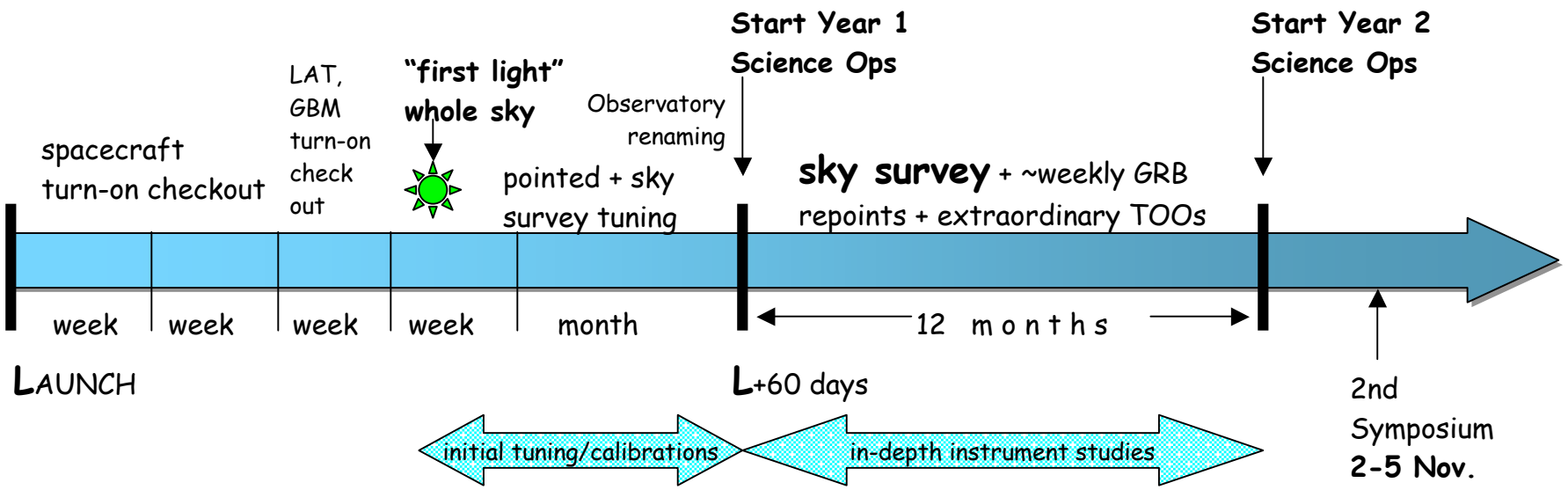
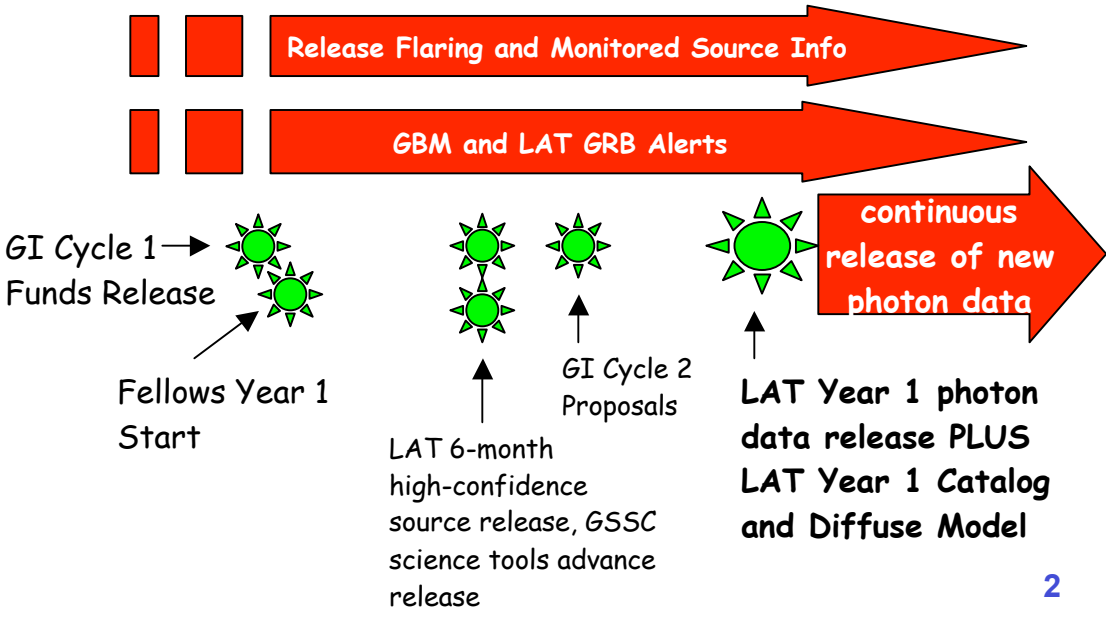
Year 1 Science Operations Timeline Plan



Thus far:
17 Atels on flaring sources
>100 GRB alerts (GCN)



Status Highlights

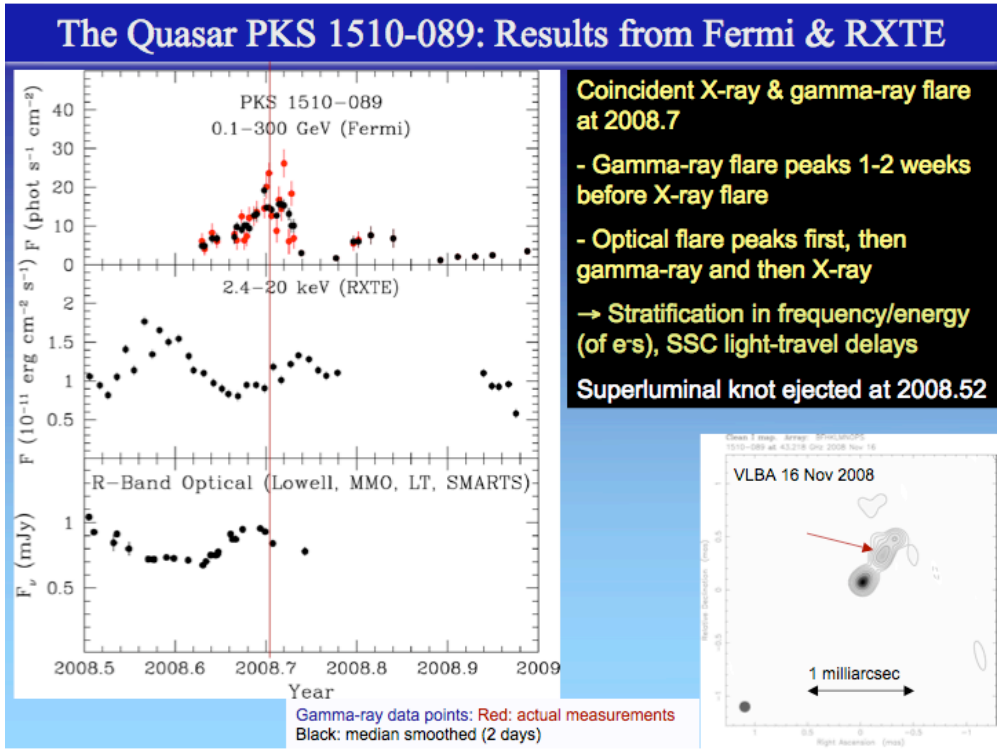
- Operations continue to be very smooth, thanks to an outstanding Flight Ops Team and great cooperation across the mission.
- Weekly operations planning meeting (see Robin's talk) and status/trending meeting (also quarterly trending meeting).
- Transition to sustaining engineering level has been smooth. Proactively working issues to maintain smooth operations, including:
  - battery management
  - FSW updates (LAT, GBM, spacecraft) for minor bug fixes, operations and science processing improvements
  - collision avoidance
  - continuously looking at robustness of fault management and opportunities for improvements
  - careful monitoring of all subsystems (including the reaction wheels)
- Preparation for GI cycle 2 (talks this afternoon)
- Symposium planning (topic this afternoon)
- Press and outreach coordination and planning, tied to major science results releases. Many papers coming out!

Fermi Results at AAS

- **Galactic Sources**
  - Vela (345.02), CTA 1 (345.03), J2021 (345.04), J1028 (345.06)
  - radio-quiet (blind) pulsar searches (612.02)
  - millisecond pulsars (345.05)
  - xrbs (468.11), transients (612.04)
- **AGN**
  - Early blazar detections (355.01, 468.08) and monitoring (468.09)
  - Initial look at populations (355.03) and variability studies (468.10) (326.03) (446.07)
  - PKS 2155, TeV connection, (355.02)
- **Diffuse Emissions**
  - first look (355.06)
  - modeling galactic diffuse (355.07)
  - Unidentified contributions (355.04)
  - Orion and Monoceros (468.12)
- **Solar system sources (355.05)**
- **GRB (345.08, 345.09)**
- **The Bright Source List (345.01)**
- **Instrument/Observatory Performance/FSSC (468.02 to 468.07)**

- **Also a press conference on pulsar results (Cominsky, Romani, Harding)**

Great to See GI AGN Studies Using Data!



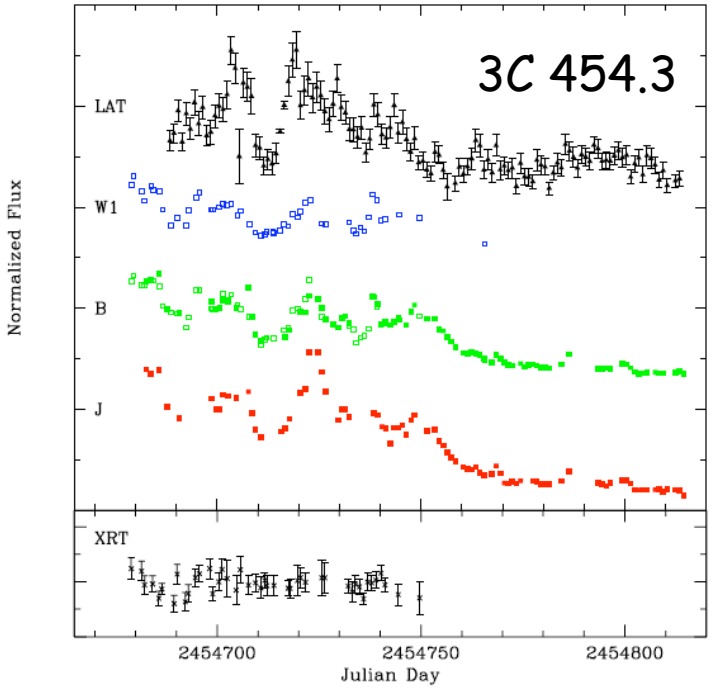


FIG. 1.— Multi-wavelength light curves of 3C 454.3 at (*top panel*) gamma-ray (0.1–300 GeV), UV (W1), optical (B), and IR (J) wavelengths from Fermi LAT, Swift UVOT, and SMARTS. Fluxes have been normalized to JD 2454700. Light curves are offset for clarity; minor tick spacing corresponds to 50% change. Fluxes at JD 2454700 are 2.83×10^{-6} cts s^{-1} at 0.1–300 GeV, 1.64×10^{-11} erg s^{-1} cm^{-2} in W1, 2.21×10^{-11} erg s^{-1} cm^{-2} in B, and 3.62×10^{-11} erg s^{-1} cm^{-2} in J. (*Bottom panel*) Swift XRT 2-10 keV light curve, normalized to flux at JD 2454700 (2.90×10^{-11} erg s^{-1} cm^{-2}). The IR/optical/UV variations are well correlated with the gamma-ray variations, with a lag of $\lesssim 1$ day, while the (minimal) X-ray variability is uncorrelated. The variability has much higher amplitude in the J-band than in B, which can be explained if there is an relatively constant blue component, as expected for an accretion disk. At z=0.859, Balmer continuum from an accretion disk, as well as Fe II and Mg II emission lines would be redshifted into the B and V bands; Hα is shifted into the J band.

Marscher et al, AAS meeting

Demonstrates the value of multiwavelength observations with Fermi data

Bonning et al arXiv:0812.4582v1

…also Jorstad et al.

Questions and Issues

- **Continuing to work on improving and coordinating the websites to make latest results readily visible and available.**
  - **suggestions and examples how best to do this are welcome!**
- **Getting the word out on Cycle 2**
  - **in addition to the Berkeley, Boston, Chicago and DC workshops, plus the email announcements (new Fermi mailing list (*http://fermi.gsfc.nasa.gov/ssc/resources/newsletter/*) and HEAD, etc…**
    - » **what else should we be doing right now?**

Onboard GRB Processing and ARRs

- GBM onboard trigger enabled in mid-July: >140 GRBs, many SGR triggers
- LAT onboard trigger enabled at the beginning of Oct in a diagnostic mode:
  - no GRB triggers above nominal thresholds
  - GRB081024B could have been found, by combining LAT and GBM info onboard (we are working on this further)
- LOTS of GBM GCN circulars, 6 LAT circulars (GRB080825C, GRB080916C, GRB081024B, GRB081215, GRB091224)
- ARR enabled at end of October: 8 ARR observed so far (4 due to GRB triggers and 4 due to SGRs)
  - Jan 22 - disabled ARR due to activity from AXP 1E1547.0-5408 (just as well, as it caused over 20 more ARR requests in the following 24 hours)
  - Jan 29 - Reenabled ARR
  - Feb 2 - Thresholds raised on Feb 2 (to account for more AXP activity), GBM FSW parameters modified to better identify SGR's onboard.

Near-term Data Releases

- **LAT Monitored Sources (recent changes)**
  - **Monitored source list now also available on a single page as a list of sources**
  - **Flaring sources added (things that flare above 2e-6)**
  - **Provide upper limits for non-detections**

- **LAT Monitored Sources (coming soon)**
  - **Daily updates**

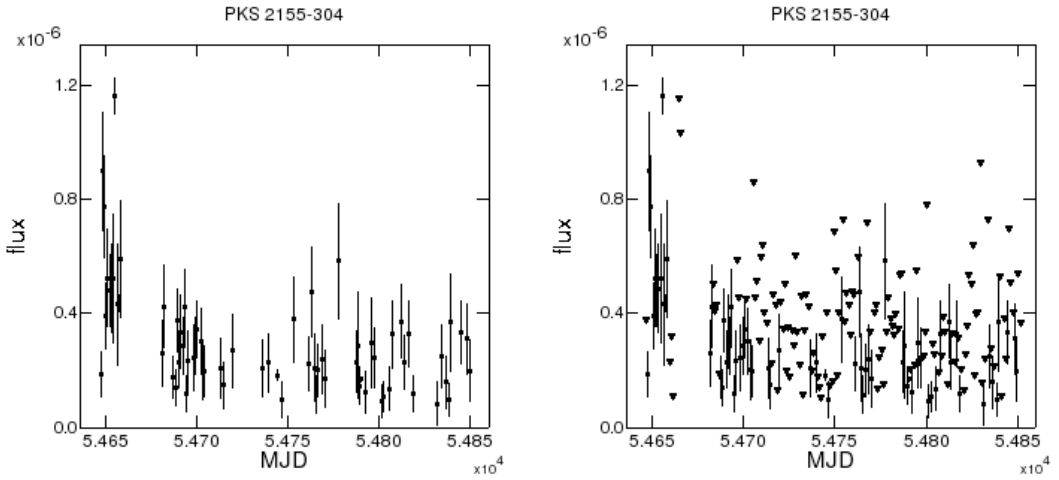
Near-term Data Releases

- **LAT Monitored Sources (changes under discussion)**
  - **Lower flaring source threshold (to 0.5 -1 e-6)**
    - **Not trivial to implement, all flaring sources need to be manually verified (of the 12 sources that "flared" above 2e-6, 10 are bright known steady Galactic sources)**
      - **Lowering the threshold will increase the burden on the people responsible for verifying the results.**
  - **Change the definition that determines when to stop "following" a source.**
    - **Currently stop if the flux (>100 MeV) integrated over 1 day drops below 2e-7 ph/cm2/s, propose changing this to 2e-7 integrated over 1 week.**

Near-term Data Releases

- **Effect of the changes**

A monitored source with and without upper limits



Two flaring sources, black is released data.