

Minutes for Fermi Users Group Meeting February 23, 2010, telecon

In attendance:

FUG Members: Alan Marscher, Pat Slane, Jamie Holder, Luigi Piro, Scott Ransom, Henric Krawczynski, Matthew Baring, Wei Cui

Others: Julie McEnery, Chris Shrader, Lynn Cominsky, Elizabeth Ferrara, Bill Paciesas, Steve Ritz, Ilana Harris, Liz Hays

Alan: Agenda change, Steve Ritz will talk for Peter.

- 1) Status of Fermi (Julie)
- 2) Education & outreach news (Lynn) - see attached PDF file
- 3) News at NASA Headquarters (Ilana)
- 4) Status of LAT (Steve)
 - Operations
 - Year-1 bright-source catalog
- 5) Status of GBM (Bill)
- 6) Cycle 3 Proposal Submissions (Chris, Julie)
- 7) F2F Meeting in May

- 1) Status of Fermi (Julie)

Julie: Observatory running smoothly. Mild “anomaly” – short GCN notice outages that affected the rapid notification of GBM bursts. The first was an on-board misconfiguration, and after that was a ground misconfiguration. Both are now solved, and each lasted for less than 24 hours.

Move to larger rocking angle was discussed last time. This has been extremely successful, with very stable battery performance since that change. The focus now is on optimizing science performance. We recently made small change to battery configuration as a first step in exploring a move back to slightly smaller rocking angle.

Another observatory topic is the reaction wheels concern. This was a significant topic of discussion shortly prior to launch due to several failures of similar wheels on other missions. At that time we concluded that the risk to Fermi was not particularly high and we mitigated this by developing observation modes that could operate with no reaction wheels. Last October, the reaction wheel on AGILE failed, and reopened this concern. We received a report from the manufacturer listing risk factors that could contribute to the observed on-orbits failures. They concluded that no action is needed to ensure a 5-year lifetime for Fermi. However, we’ve been looking at ways to mitigate against the identified risk factors. None of these mitigations are expected to have an effect on the science data.

Question: does this affect the operational/survey mode?

Julie: No, we’ll stay in survey mode. We’re looking at changing the operating pattern to remove the sun avoidance and cap the rate of the yaw flip. This will result in smaller slew

speeds and a better survey mode. The changes will be easier to explain with charts at the next meeting.

Another topic is collision avoidance. JSpOC routinely performs analysis of possible close approaches in orbit. We are notified if there is a potential close approach. If sufficiently close, we start planning a maneuver to get out of the way, which happened a few weeks ago. We have not yet enabled our propulsion system, and may never. But we use these events to learn more about the subtleties of planning for future events.

Regarding GI funding split across the fiscal year boundary. This happened for FY09/FY10. There was a delay in funding the second half of the cycle 2 grants partially due to a continuing resolution at the beginning of this FY, so there was no money to pay some cycle 2 GI grants until well into FY10. This was fixed quickly when we explained the issue to HQ. Better communication should help avoid this situation in the future. We will continue to split GI funding across fiscal year boundaries for Cycle 3 and Cycle 4. Options for splitting the money are to fund some grants in FY10 and others in FY11, another option is to partially fund each grant in FY10 and then send the rest of the money in FY11. We're currently exploring what administrative overhead will accompany splitting individual grants. Hopefully we'll have a better concept of the options/issues by the F2F meeting. Also, as a heads-up for discussion at the next F2F, the budget request for Cycle 3 will ask specifically about the urgency of need for funding for the various proposers, to help us decide how to phase the money across the fiscal year boundary.

Communications: we agreed at the last meeting to add GBM quick-look capability. This has been done. The LAT team is writing a weekly sky blog. They also make entries outside the weekly schedule if other items of interest happen. In addition, there is a daily blog, but the entries are less focused on items of interest.

2) Education & outreach news (Lynn)

Lynn: I sent a PDF because a lot of what we do is visual. We sent 12,000 lithographs and many calendars as part of the IYA. 1st Mon in March will be the Fermi EPO episode, which will feature the pulsars as galactic GPS discussion. The Space Mystery has been approved by NASA product review. At this point we have completed all planned pre-launch items. There was a podcast done on the pulsars as GPS topic with Paul Ray, which aired Feb. 11th. These podcasts typically get 5-6 thousand immediate views, with more after. There is a new goodie that will be available for the HEAD meeting. It will feature the Fermi all-sky map which is a great representative for the mission. This image was also submitted to APS and was chosen for their homepage. To see the various homepage images when you go there, use the F5 key to flip through the images.

Request from Pat: It would be handy to have the links of what outlets have picked up on the press release given at the APS meeting.

Lynn: I'll send that along when I get them.

Julie: New number: 866-705-0233, 7095502#

3) News at NASA Headquarters (Ilana)

Ilana: Brief news, there's one thing for the radar screen. We're all under a lot of pressure to have money that is sent out being obligated and costed, even at the individual grant level. We need to know if you don't think you'll spend all the grant money. If you are using the money, at least obligate it.

Question: What's the time scale to get a GI grant fully obligated?

Ilana: The idea is to obligate it by the end of the fiscal year.

Julie: We're starting to review here...to get an understanding of the administrative load.

Ilana: Right now it's at the level where if you know you won't spend the money until later due to hiring delays, etc, then let us know. This is on every level now.

Alan: This is going to cause a lot of disruption once NASA decides to implement it.

Ilana: Yes, we have doubts as to how the universities are going to handle this. All this is known. We were hoping this would go away, and we're pushing back. The concern is that they'll say "if you're not spending the money, we'll take it back."

Julie: To help with this we'll be adding a question into the request for budgets so people have a way to tell us about their needs.

4) Status of LAT (Steve)

Steve: Peter regrets he missed the meeting. For LAT operations, things are extremely smooth. We recently had the 100 billionth trigger. Mostly these are background, but it's still a very impressive milestone. Typically, it's taking about 10 hours from photon arrival at the LAT to delivery to the FSSC. This is well below requirements, and a testament to everyone's hard work. Data delivery is at more than 99.9999%. A power outage at SLAC due to heavy rains took us down for 4 days. There were some lessons learned from bringing up the backup ISOC. No data was lost, but improvements can be made.

The LAT Catalog paper is posted on both the FSSC and arxiv/astro-ph. Seth Digel will be giving a talk on it at the HEAD meeting. At this point there are three catalogs; the 1-year LAT catalog, an AGN catalog submitted recently, and a pulsar catalog that was released in October.

Alan: What is the ordering of the listing in Browse? The output does not appear to be in order of right ascension.

Julie: XML may be based on the output of the catalog, and not in RA order.

Alan: For casual users, the Browse table takes getting used to.

Julie: We will take the action to use the Browse table to get a PDF or ascii output posted to the website

Steve: The Catalog lists 1451 sources based on 11 months of data. The exposure is very uniform at the 25% level. The typical 95% error radius is ~ 10 arcmin. 241 sources show as variable. There are positional associations for about half of the sources; blazars ~600, pulsars ~60, and many other source types. Each entry has coordinates, error ellipse, flux based on integrated data, significance, quality flags (161 sources flagged due to galactic ridge and diffuse emission), and flux in 5 energy bands. There are 671 sources in the AGN catalog, for sources above 10 deg in galactic latitude. There were 46 pulsars in the

pulsar catalog (first 6 months of data), with 16 pulsars discovered in blind searches. Now there are about 2 dozen new pulsars from blind searches. The image from the catalog will be an upcoming APOD, where the cursor will give source location and association by type.

Alan: This is a tremendous achievement.

Steve: Currently there are 62 LAT papers out with more on the way. It will be useful to discuss long-term developments with the LAT going forward at the next F2F.

Ilana: We should think of a way to track papers coming out not just from LAT, but from others as well.

Julie: Yes, I noticed that recently the number of papers from authors outside the LAT team is rising. We need to find a way to track this.

Steve: It would be great if the FSSC can do this.

Chris: We'll discuss internally how to do that.

Ilana: It should be something we can do by running a script.

Julie: Another straightforward way to do that is look at key papers and see which papers cite them.

Chris: It will require some combination of automation and human interaction.

Ilana: The goal is to show the impact of Fermi is greater than the GI program.

Steve: The LAT team has a page that currently tracks this. But adding a listing of the rest of the world's LAT papers would be useful.

Question: Is there a plan to regularly release these catalogs?

Steve: I don't recall the timescales that are planned.

Julie: Most Catalog presentations discuss 1, 2 and 5 year catalogs. I don't know if that's a requirement or just a plan.

Steve: It would be helpful to hear from the FUG, to find out what they think is useful.

5) Status of GBM (Bill)

Bill: Things are going well with GBM. Instrument performance is going great. Gamma-ray burst trigger rates are stable as expected. There have been no soft gamma-ray repeater triggers in a while. But we made up for that with solar flares in the past couple of months, with several flare triggers per week. Also interesting are the terrestrial gamma-ray flashes from lightning. We found that the BGO data on the TGFs has been very interesting. A flight software upgrade loaded in November allows us to trigger on TGFs by combining BGOs with the NaI detectors for triggering. The TGF trigger rate has increased by a factor of 7, so now we're detecting a couple per week. An idea for future improvement is to dump time-tagged event data at times when TGFs are more likely. This would increase GBM data by quite a bit, but only at ~5% level for the overall mission. This would allow us to look for TGFs on the ground without requiring triggers. It does require a FSW change, so won't be implemented until early summer timeframe.

Papers and catalogs. We have a talk next week about the GBM catalogs, in particular the GRB catalog. The first year catalog is not yet completed, but we have 2/3 of the processing finished and expect to finish in the next month or so. There are three catalogs

for GRBs, similar to BATSE; a general catalog with basic information for all bursts, plus 2 spectral catalogs – 1 for bright bursts, and 1 for dimmer bursts. The spectral catalog is in progress, and will be early to mid-summer for that. We have put out a catalog paper on the TGFs, which will appear in JGR. A second catalog for the 2nd year will have many more entries thanks to the FSW update. SGRs will have a catalog paper, but I'm not sure when. Pulsed source and occultation techniques will each have catalog papers, but I don't know the timeframe. The GBM team has been involved in all the LAT GRB papers (5-10 papers). There is one paper on GBM-only data, and then the catalog papers. There are a couple more TGF papers, one submitted and two more will be submitted in next few months. A couple SGR papers have been published. One accreting pulsar paper has been published.

6) Cycle 3 Proposal Submissions (Chris, Julie)

Chris: First, briefly, the data analysis workshops were undertaken in the months leading up to the proposal deadline. We solicited community for locations and desired topics. In the end we did four regional venues, each with 4-5 tutors and 20-25 participants. I think this was a worthwhile exercise and worth doing in future proposal cycles.

Cycle 3 – proposals were due Feb 5. We received a comparable number to Cycle 2, with 192 proposals that includes 10 progress reports. Assuming the dollar figure the same as last time, the oversubscription rate is ~2.5. There was an increase in the level of time requests for NOAO/NRAO projects, with substantial oversubscription for NRAO. The peer review will be in the 3rd week of April. Stage 1 letters should be sent the week of May 3rd. At that time we'll solicit budget proposals with a modified letter to solicit information about optimal funding timeline. For certain situations, it may be best to have funding deferred to the next fiscal year. My guess is that most requests will be for immediate funding. But having the information will be an improvement over the arbitrary decisions that were made last year.

Matthew: The hope was that this year there would be an increase in number of proposals, to help stave off funding cuts. What do you think the prospect is now for future funding, since the proposal numbers did not increase?

Julie: Because the data are all public and there is no need for pointed observations, we have removed a lot of the pressures to propose. So we've obtained a fraction of the proposals you receive for other observatories. Also, fully-funded observers have no need to propose. It's clear we need to put together the case that the impact on Fermi on science is greater than just what you see through the GI program.

Steve: Is phase 2 on track for mid-May?

Chris: Yes, we want to turn around phase 1 in a little over a week's time.

Ilana: The bottleneck is getting on the calendar. It will take me about a week to go through the text from the review. Then it's just getting on Jon Morse's calendar to present the recommendation. Usually he has questions about the multi-year projects, but there are usually no surprises. Once he signs, we can send the letters out. That leaves a month for the budgets. Results should be out within 2.5 weeks post review.

7) F2F Meeting in May

Alan: Let's do items for the F2F meeting done by email. If you have anything in mind now, please send it to me now.

F2F meeting items from today's meeting:

- Operations changes for reaction wheel rate mitigation
- Long-term paper development with the LAT going forward
- Future surveys

Actions:

- 1) Use the Browse table to get a PDF or ascii output posted to the website with the 1FGL sources in RA order.
- 2) FSSC find a way to track papers from authors outside the LAT/GBM teams using Fermi data.
- 3) Add Jamie Holder and Wei Cui to User's group list, also add Liz Hays and Elizabeth Ferrara