GLAST Burst Monitor Team Hard at Work Fine Tuning Instrument and Operations

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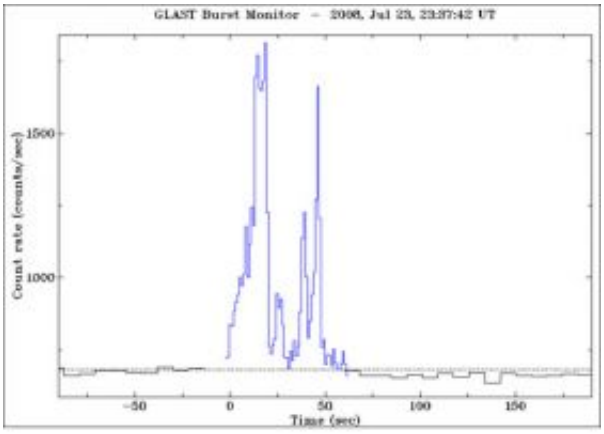

This graph depicts a gamma-ray burst captured by the GLAST Burst Monitor on July 23. This powerful burst lasted over 50 seconds and was captured by each of the instrument's 14 detectors. This burst was not detected by any other gamma-ray burst satellites, because all were pointed at different parts of the sky at the time. One of the novel and important attributes of the GLAST Burst Monitor is that the instrument can see the entire sky, except where the Earth blocks its field of view. (NASA)

(PhysOrg.com) -- While only on orbit for 40 days and still in the process of a two-month checkout, NASA's Gamma-ray Large Area Telescope (GLAST) has already detected 12 powerful gamma-ray bursts, an encouraging harbinger of good things to come for this mission. The gamma-ray bursts were detected by the GLAST Burst Monitor (GBM), one of two instruments on the spacecraft.

"We are thrilled to be detecting gamma-ray bursts so early in the mission. GLAST and the GBM are off to a great start!" said Charles "Chip" Meegan, GBM principal investigator at NASA's Marshall Space Flight Center, Huntsville, Ala. "The detectors are working well and we're really pleased with how the instrument is working. That said, we're using this checkout period to scrutinize the data coming down from the detectors and fine tune flight and ground software and our daily operational processes."

GLAST will observe gamma rays ranging in energy from a few thousand electron volts to many hundreds of billions of electron volts or higher, the widest range of coverage ever available on a single spacecraft for gamma ray studies. By detecting gamma-ray bursts, GBM will help GLAST crack the mysteries of these stupendously powerful explosions.

One of the priorities of the GBM science team during checkout has been to diligently validate burst location information provided by GLAST against independent observations made by NASA's Swift spacecraft, another instrument dedicated to the study of gamma-ray bursts. GBM can see the entire sky, but Swift's field of view is more limited. Even so, Swift spotted four of the 12 bursts detected by GBM. The GBM science team matched up Swift burst location information against that provided by GBM and found it matched.

This is important because once GLAST becomes fully operational, when the GBM spots a gamma-ray burst, the spacecraft will relay near real-time burst locations to ground-based telescopes or space-based observers, including the Large Area Telescope (LAT), GLAST's primary instrument. Gamma-ray bursts are fleeting events, lasting only a fraction of a second to a few minutes. Signaling other observers to capture complementary data about these powerful explosions is essential to learning more about these mysterious events.

"GBM is performing beautifully and when we're fully operational, we'll know with confidence we're providing the correct address for the location of bursts to scientists all over the globe," said Meegan.

Once fully operational, scientists and operations personnel at the GBM Instrument Operations Center will report the burst locations just seconds after they are detected. Wider notification of the burst will be sent out through the Gamma-ray Coordination Network, to interested ground-based observers. The operations center is located at the National Space Science Technology Center (NSSTC), which is a partnership between NASA, the state of Alabama and several universities.

Another challenge for the GBM team during this checkout period is to practice and rehearse team operations and make sure all members of the team are synched up and working together smoothly. The Huntsville-based GBM team collaborates closely with astrophysicists at Max Planck Institute for Extraterrestrial Physics in Garching, Germany. NASA collaborated with the Institute through an agreement with the German Aerospace Center to design the GBM. The institute built the monitor's power supply and crystal detectors – the main component for intercepting gamma rays. German colleagues look at real-time data during their normal work day, offset seven hours from Huntsville, therefore providing additional coverage in monitoring instrument performance and interpreting data from gamma ray bursts. Each morning, the entire team meets up for a cross-Atlantic teleconference, exchanging information about new bursts and planning for future operations.

"The whole team is really coming together and we're in good shape to begin pouring over the 100 megabytes of data we're receiving daily from the spacecraft." said Meegan. "The most exciting part of the mission is still ahead when we, hopefully, begin to answer long-standing questions about how these fantastically powerful gamma-ray bursts are produced."

NASA's GLAST mission is an astrophysics and particle physics partnership, developed in collaboration with the U.S. Department of Energy, along with important contributions from academic institutions and partners in France, Germany, Italy, Japan, Sweden, and the United States.

Provided by NASA