
Burst Group Summary

Peter Saulson, Co-Chair

The Burst Group

- **Chairs:** Sam Finn and Peter Saulson
- **Web page:**
<http://www.ligo.caltech.edu/~ajw/bursts/bursts.html>
- **Electronic notebook (active since E7):**
<http://cosmos.nirvana.phys.psu.edu/enote/>
- **Mailing list:** bursts@gravity.phys.psu.edu
- **Bi-weekly telecons:** Tuesdays 3:00 p.m. ET (next one 26 Feb)

Burst search

Our job is to search for transient events, especially those that are poorly modeled. Thus, we can't use matched-template technique. Instead, we look for "something unusual."

Three LDAS filters now being developed to recognize candidate signals:

- Excess power in tiles in the time-frequency plane
Flanagan, Anderson, Brady
- Adaptive search for time-frequency clusters
Sylvestre
- Time-domain templates for large slope or other simple features
Daw

We are also searching for unusual features coincident with external triggers, such as gamma ray bursts or supernovae.

ALLEGRO and GEO data were also collected during E7.

Burst pipeline

- Triggers generated by LDAS filters, written to DB.
- Vetoes generated by DMT monitors looking at PEM channels and at internal ifo diagnostic signals, written to DB.
- Event Tool reads DB to define candidate events:
 - Ignore triggers at times that are vetoed
 - Merge multiple adjacent triggers into well-defined events
 - Analyze events from all ifos to determine which are coincident
 - Draw histograms, analyze statistics of coincidences.
- Calibration of the above by simulations.

Burst search interpretation

Three styles of interpretation are now being explored:

1. Coincidences with GRB triggers

Analyzed by technique of Finn, Mohanty, and Romano

Are the outputs of our ifos different during GRBs?

2. Astrophysically-motivated search

Look for transients with features suggested by our (limited) understanding of supernovae, black holes, etc.

3. “Instrumental” search

Search for coincident transients in our ifos, with no prejudice about the form of the signals or the nature of their sources.

Status

- **During E7**
 - All three filters ran on LDAS at LHO, LLO
 - GRB triggers were collected
 - “Glitch” monitors were applied to PEM, ifo diagnostic channels
 - Interactive detector characterization work investigated causes of AS_Q glitches at LHO 2k, LLO 4k.
- **Since E7**
 - Continued tuning of filters
 - Revision of glitch monitors
 - Statistical characterization of “playground” subset of E7 data
 - Start of simulation study using search filters, injected signals
 - Development of Event Tool

At the LSC meeting

We will

- discuss the results of trial runs of the filters, vetoes, and simulations,
- make plans for the final run of filters and vetoes on coincident E7 data,
- have a general discussion of the scientific interpretation of the burst search, and
- work out post-processing steps leading to science results.