Planning notes from August 2005 Burst Group Face-to-Face Meeting

LHO, August 18, 2005

Peter Shawhan, scribe

MDC Issues

- Issues
  - How to group waveforms into sets
  - Validation of antenna pattern, etc.
  - Documentation
  - Review of GravEn
  - Additional information to write to log files
- h(t) injections
- Need someone to learn how to run the code and to help lead decisions on waveforms, etc.

S4 Untriggered Search:
Steps to completing search

- Choice of GW channel and frequency range
  - DARM_ERR, 64-1600 Hz
- DQ flags – Finalized now
- Vetoes
  - Don't need AS_I
  - Need deadtime re-evaluation
  - Examine remaining 3 events (with Gamma>4)
  - Subset of vetoes to be determined by looking at efficiency and deadtime contributions
- R-statistic – apply notch filter at violin mode freq
- Choice of GS and Gamma thresh – use 1.9, 4.0
- Technical documentation
- GravEn and MDC production need to be reviewed

S4 untriggered search: Scope and strategy for paper

- Scope of analysis and paper
  - Simulations – SG, Gaussians, WNB now
    - Consider: Inspirals, cusps, whistles, SNe (need conditioning), mergers (need inclination angle variation), ringdowns
    - Add: inspirals (bare), cusps, a few other things
  - Combining S2/S3/S4 ?
    - Can't add S3

- Paper production
  - Lead author(s) – Peter Sh, at least for now
  - Timeline
    - Sept 1: Start writing
    - Sept 15: Analysis has to be done, including simulations
    - Oct 1: Complete draft within group
    - Oct 19: Give draft to reviewers
    - November LSC

S2/S3/S4 GRB Analyses

- One paper containing results from both Isabel's and Soumya's analyses
  - Upper limits on individual events
  - Tail
  - Population properties
- Remaining work
  - Finish simulations
  - Technical notes
  - Code reviews
- Timescale
  - First draft by end of September
  - Technical notes / paper draft to reviewers in mid Oct
  - Draft to the LSC by November

Other S3/S4 Papers?

- CQG S3 proceedings paper?
  - Simply a record of what was shown at Amaldi
    - No rigorous upper limit
    - Rough sensitivity
  - It's permissible according to LSC rules
  - The timescale is too short. Could there be a significant extension? Don't count on it.
- BlockNormal method paper
- BlockNormal-based veto paper
- S4 H1-H2 Q pipeline paper
- H1-H2 Null stream methods paper
- LIGO-GEO methods paper(s)
- LIGO-GEO S4 search paper in the future?

S5 Analysis Strategy (1)

- Online data processing
  - Purposes: rapid feedback, DQ/veto studies, trigger generation for final analysis

- Instant search
  - We want to do this
  - i.e. high-threshold, say at n times the threshold that would yield a background rate of 0.01 events per S5 run – set using first ~2 weeks of data from the run?
  - Go ahead and look at zero-lag events
  - Take OR of mulitple search algorithms? Yes, in principle

- Fast-track analysis/es for presentation in March 2006
  - All-sky general search using ~2 months of data
  - Don't update calibration until final version is available
  - GRB analysis ?

S5 Analysis Strategy (2)

- Eventual offline searches – define later
- Usual scope issues: frequency range(s), etc.
  - Would like to search up to ~7 kHz
- Key strategy issues
  - The S5 run is long. How to keep up with the data?
  - Generate and analyze MDCs too as we go. What waveforms?
  - Write and maintain technical documentation as we go

S5 Detector Characterization (1)

- DMT monitors / figures of merit
  - BurstMon – may need tweaking or at least explanation
- Feedback from online analysis
  - Near-real-time: PowerMon, …
  - Daily statistics / summary
- Watch instant analysis on a ~daily basis
  - Check that threshold still seems reasonable
  - React to zero-lag events if necessary
- Prompt generation of data quality information
  - Generated by existing DMT monitors
  - Also look for things which should be new DQ flags; implement

S5 Detector Characterization (2)

- Rapid-turnaround diagnosis of glitches
  - For instant high-threshold (detection) search, OK to look at single-ifo glitches
  - For final low-threshold search, limit to time-lagged coincidences, or triggers known *not* to be triple coincidences for making decisions about vetoes; but, it's OK to see an association with a microphone glitch, say, and then do a systematic study of the veto efficiency of microphone glitches. But really, we should study microphone channels as potential vetoes a priori.
  - Use aux triggers from GlitchMon, DataQual, KleineWelle, Q, etc.

S5 Detector Characterization (3)

- How to organize?
  - Well-defined set of people, talking frequently
  - Web page, electronic notebook
  - Internal daily/weekly checklist

- Keith R's slides:
  - "War rooms" for each search group
  - Daily detector elog summaries with key FOMs
  - More detailed reports on weekly basis for start of S5
  - Migration of search FOM studies to control room as we gain experience
  - Be willing to help track down specific instrumental artifacts
  - Make scimon instruction pages

S5 Analysis Infrastructure

* Will we have what we need?
    - Computing resources
        - Observatories, PSU will have working clusters
        - How to prioritize with respect to other analysis groups
    - Data availability
        - LHO and LLO data in same place?
    - Software tools to support analysis summaries, glitch diagnosis, etc.
        - Might want/need to unify/rewrite
    - Scripts/programs demonstrated to work at intended place

S5 Burst Analysis Computing Plan

- Need to write up a S5 Burst Analysis Computing Plan
  - What we will run, why (one or more purposes), where we will run, CPU requirements, data availability requirements, where output will go, output disk space requirements, need to publish triggers into LDR?
  - State software components to be used (and whether they exist, need to be modified, or need to be created); also status of testing at intended location
  - State priorities
  - Should document (and attempt to rationalize?) formats and protocols