

Summary of Detector Characterization Sessions

Keith Riles (University of Michigan)

***LIGO Scientific Collaboration Meeting
LSU – August 17, 2006***

Presentations in DC Sessions

Lots of interesting talks!

**Can't do justice to all of these
in this brief summary**

Will just try to hit the highlights

Agenda page:

http://gallatin.physics.lsa.umich.edu/~keithr/lscdc/agenda_aug06.html

DC Session Highlights

Calibrations, Timing, and Injections:

- **Photon calibrator studies (seeking resolution) (PeterK and EvanG)**
- **High freq (FSR) calibration – want direct measurement (StefanosG)**
- **S5 timing stability very good ($< 3\mu\text{s}$) – tiny modulations (SzabiM)**
- **S5 injections running routinely (VukM)**
- **Matched-filter HW injection checks (few pathologies) (MyungkeeS)**

Data Quality:

- **Making good use of new segment / DQ database – new flags and more on the way (JohnZ)**

DC Session Highlights

S5 glitch investigations:

Glitch Group continues to investigate zoo of transient artifacts in S5 data and giving feedback to commissioners

- **KleineWelle Studies (burst veto evaluation) (ErikK)**
- **Inspiral vetoes (selection criteria & hierarchy) (GabyG)**
- **Automated follow-up of inspiral candidates (JeffK)**
- **Block-Normal Triggers & Event Display studies (ShantanuD)**

DC Session Highlights

Other noise investigations:

- **S5 environmental disturbances** (HVAC followup, mag. Couplings, interesting 123.995 artifact, dam noise) (RobertS)
- **S5 upconversion studies** (clues & mysteries) (SamW)
- **Cosmic ray events** (1 interesting shower) (RayF)
- **Suspension thermal noise** (clamps a problem?) (SteveP)

S5 spectral line investigations:

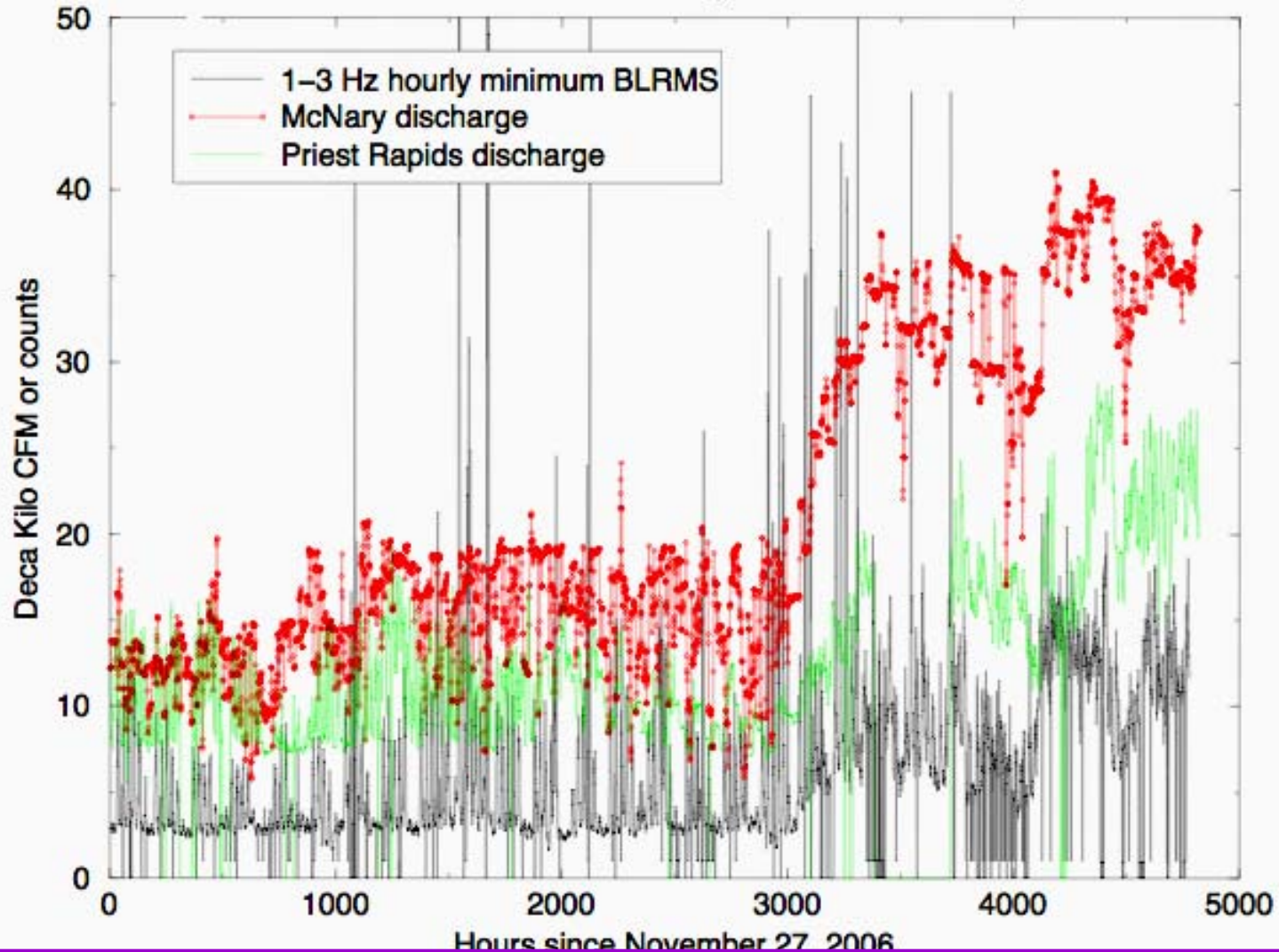
- **Many residual lines tracked – need help in identification** (KeithT)

Dam 60 km away sets maximum inspiral range

(discovered by Justin Garofoli)

Dam Discharge and 1–3 Hz BLRMS hourly minimum

BLRMS minimum follows McNary better than Priest Rapids



LIGO

Dam affects inspiral range through upconversion of seismic signal at 1.2 Hz.
“Bounce” of water timed at 1 to 0.3 second.



Large mass bouncing on the ground at our most sensitive frequency

DC Session Highlights

DMT developments:

- **S5 infrastructure in good shape – new / improved monitors (JohnZ)**
- **PulsarMon – Crab FOM studies & new FOM's (GiovanniS)**
- **PlaneMon – Better precision on airplane trajectories (EvanG)**
- **StrainBandsMon – Tracking band-limited calibrated strain (KeithR)**
- **SixtyHertzMon – Identifying 60/120/180 Hz upconversion (KeithR)**

Data set reduction:

- **Reduction working smoothly (few new channels) (GregM)**

DC Session Highlights

Modeling:

- **End-to-End model of Mode Cleaner – LIGO I and AdLIGO (SanyY)**
- **Spherically Invariant Random Process (SIRP) Modeling applied to LIGO data – Meant to improve inspiral noise estimation (InnocentoP)**

Detchar Reorganization (New working groups)

Working Group	Chair(s)
Glitches	Laura Cadonati & Shourov Chatterji
Spectral Lines	Keith Thorne
Environmental Disturbances and Channels	Robert Schofield
Timing Precision and Stability Monitoring	Szabi Marka & Daniel Sigg
Upconversion	Sam Waldman
Inter-channel Correlations	Nelson Christensen
Data Quality and Validation	John Zweizig
Hardware Signal Injections	Vuk Mandic & Peter Shawhan
Data Set Reduction	Isabel Leonor & Greg Mendell

Detchar Reorganization

GEO collaborators have been invited to name a GEO liaison for each LIGO detchar working group

- Report on related GEO detchar issues
- Report back to GEO on LIGO detchar work

Formally, the Detector Characterization Committee consists of the **working group chairs**, three at-large members appointed by the LSC Spokesperson (**Rana Adhikari, Gaby Gonzalez, Erik Katsavounidis**) and **KR** as Chair.

→ Will serve as steering group for detchar activities

Organizational Meeting held today after lunch

Agenda

Round table on ideas for more effective detchar work

- Recruiting new working group members (including operators)
- Coordination among working groups
- Do we need additional working groups?
- Documentation (web pages, annual report, white paper)

Scimon Camp

Starts tomorrow at 8:30 a.m. at LIGO Livingston Observatory

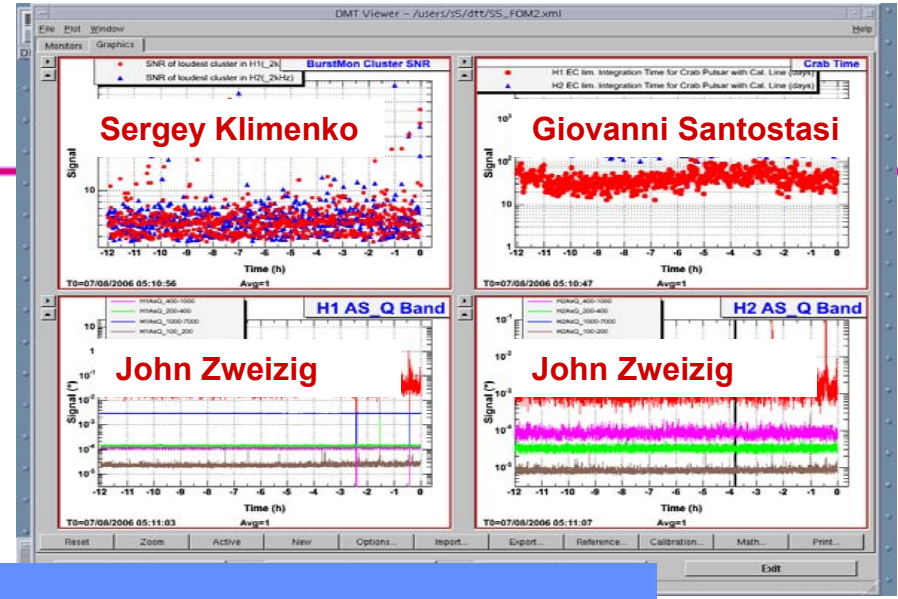
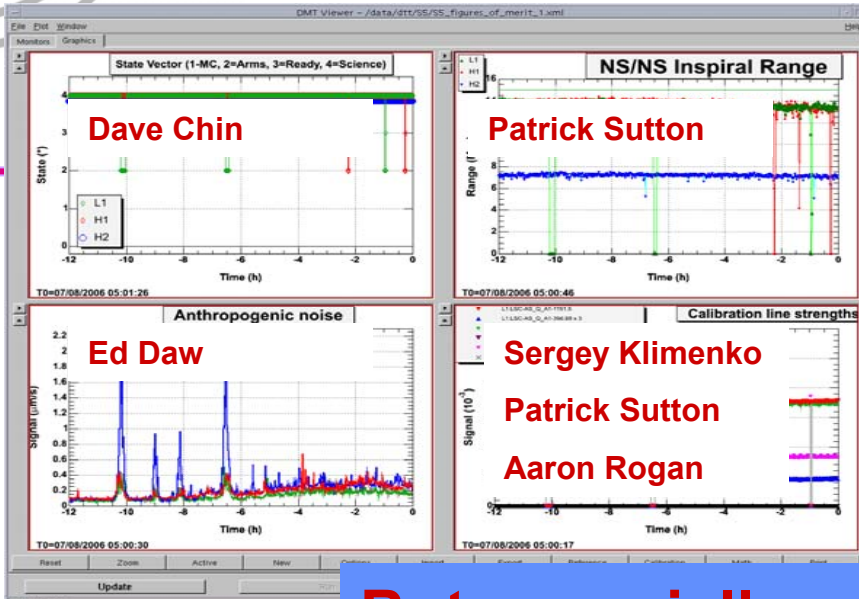
[Link to program](#)

~50 participants (11 instructors)

Mixture of general talks (interferometry, calibration, etc.) and software tutorials (DTT, DMT, etc.)

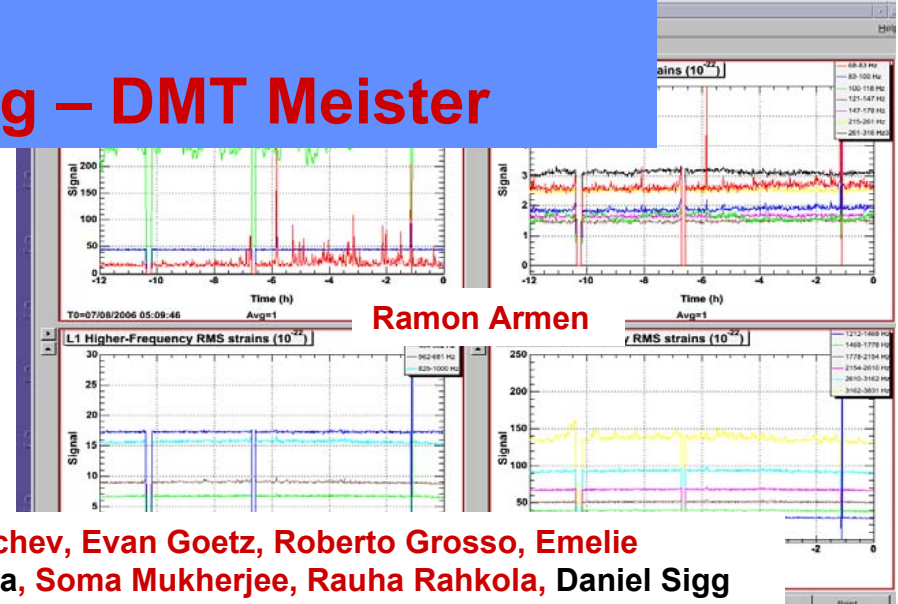
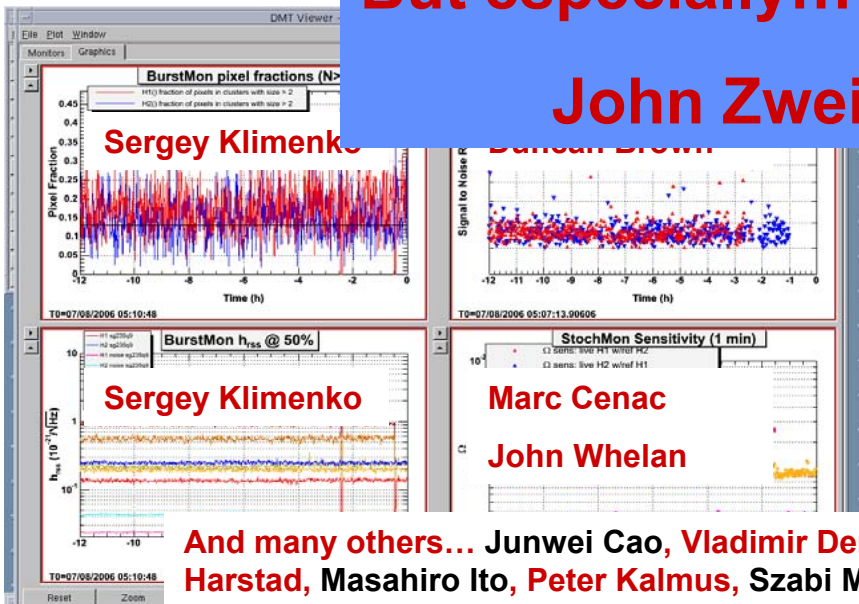
Participants needing ride: **Please sign up at Linda's table**

S5 Figures of Merit



But especially...

John Zweizig – DMT Meister



And many others... **Junwei Cao, Vladimir Dergachev, Evan Goetz, Roberto Grosso, Emelie Harstad, Masahiro Ito, Peter Kalmus, Szabi Marka, Soma Mukherjee, Rauha Rahkola, Daniel Sigg**