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# Summary of Detector Characterization Sessions

**Keith Riles (University of Michigan)**

***LIGO Scientific Collaboration Meeting  
Baton Rouge – March 22, 2007***

# Presentations in DC Sessions

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**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\\_mar07.html](http://gallatin.physics.lsa.umich.edu/~keithr/lscdc/agenda_mar07.html)**

# DC Session Highlights

## Calibrations:

- **S5 V3 being released** (L1/H1 ready, H2 nearly so) **MyungkeeS**
- **Photon calibrator studies** (10-20% discrepancy with coils ) **(EvanG)**
- **Photon calibrator mirror deformation** (masses not rigid!) **(StefanH)**
- **VIRGO calibration status** (coil method for now) **(LoicR)**
- **High freq (FSR) calibration** (stochastic use under review) **(StefanosG)**

## Timing:

- **S5 timing stability** (ideal talk – boring) **(SzabiM)**

# DC Session Highlights

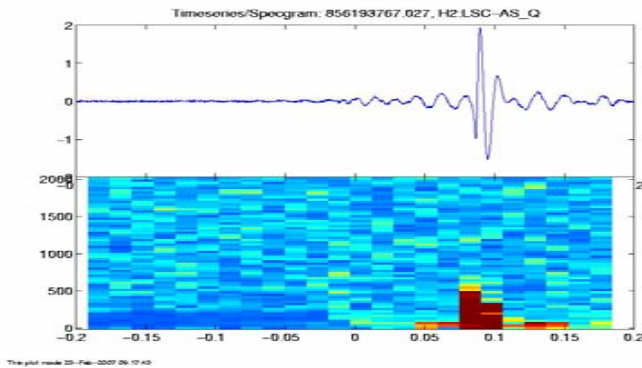
## S5 glitch investigations:

Glitch Group busy investigating transient artifacts in S5 data and giving feedback to commissioners

- Overview of investigations / tools (call for volunteers) (ShourovC)
- New kinds of Block-Normal Triggers (exotic zoo) (ShantanuD)
- Defining S5 epochs (range & KW-glitch based) (GabyG)
- Glitch classification (pipeline done – start coinc studies) (SomaM)

# (Unknown) Unknowns

- No clue for about 40 % of Block-Normal outliers or even if the same cause is responsible for some of them.



Example of Lonely glitch

No luck from doing full-frame Q-scans or event displays

Maybe some glitches don't show up in Q-scans/spectrograms of any other diagnostic channels?

- Maybe tools such Hilbert-Huang transform /multi-dimensional classification could help understand and/or categorize the unknown glitches.

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## Data Quality:

- Updated DQ flags, brand-new flags, flags on the way, recommended usage (JohnZ)
- Capturing DQ information in elogs (call for volunteers) (TiffanyS)

# DC Session Highlights

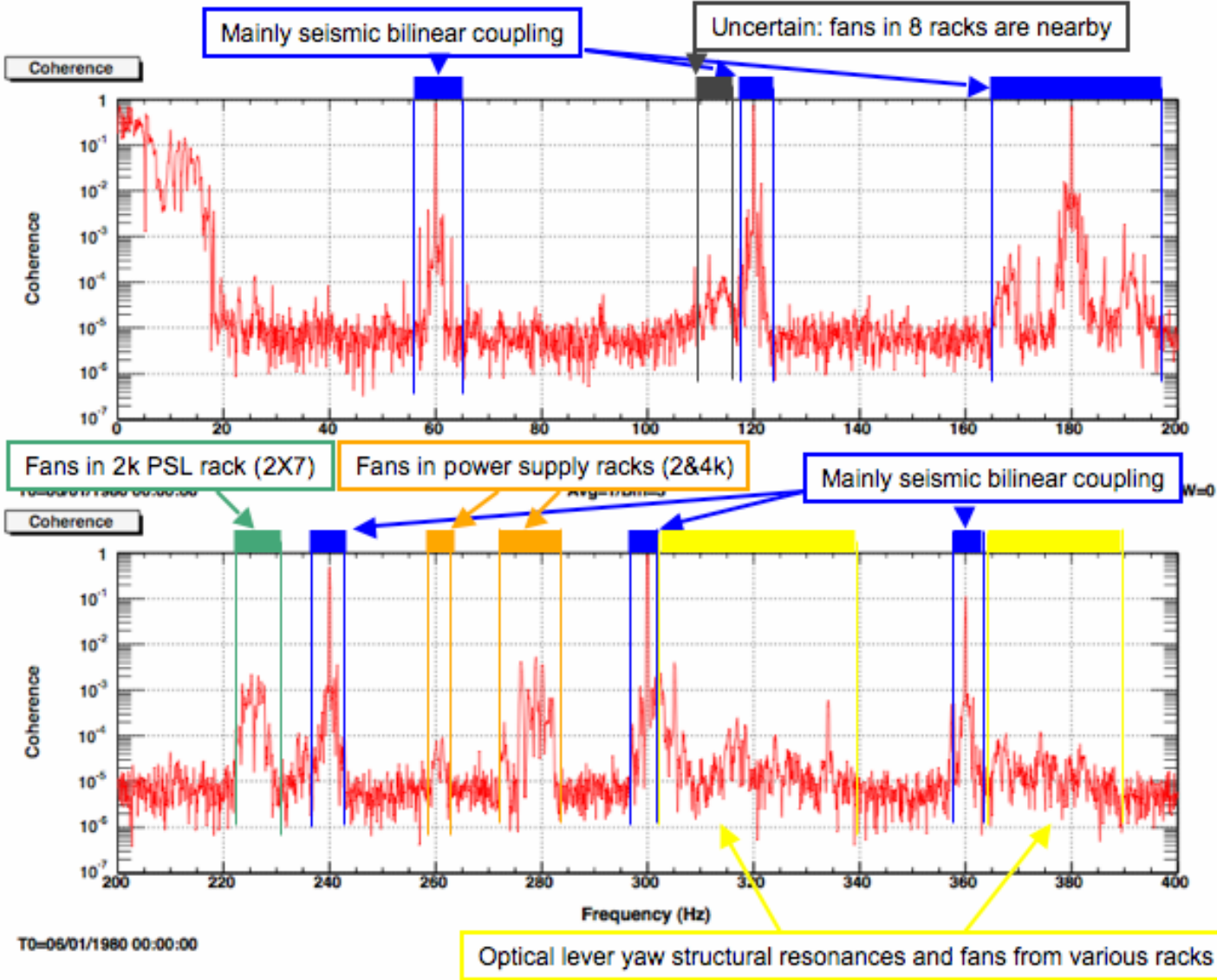
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## S5 spectral line investigations:

- **Mature, multi-working-group effort (KeithT)**

## Other S5 noise investigations:

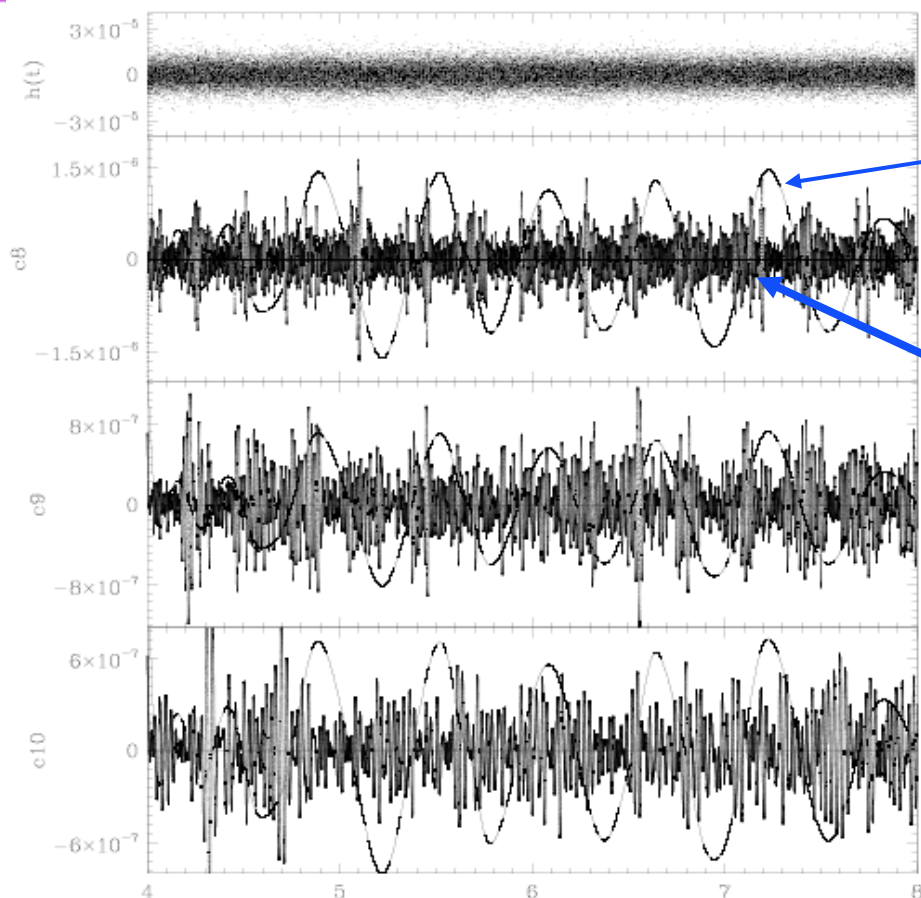
- **S5 environmental disturbances (review & update) (RobertS)**
- **LHO seismic studies (new DQ flags) (MasahiroI)**
- **S5 upconversion studies (Jackson E&M redux) (SamW)**
- **Hilbert-Huang transform (upconversion vs time) (JordanC)**



From Robert Schofield's talk



# LIGO Phasing of upconversion burst noise relative to test mass motion



1.7 Hz Test mass motion

Bursts of upconversion noise occur at zero-crossing of test mass motion

(This corresponds to zero-crossing of SUS coil current)

Bursts do not appear to be regular and predictable

From Jordan Camp's talk

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## Injection studies:

- **Matched-filter checks (good agreement) (MyungkeeS)**
- **Inspiral parameters (good agreement) (SteveF)**

# DC Session Highlights

## DMT developments:

- **S5 infrastructure (~150 monitors running – more on the way)** (JohnZ)
- **PulsarMon – Recent improvements** (GiovanniS)
- **PlaneMon – Preliminary S5 DQ flags** (EvanG)
- **SixtyHertzMon – Identifying 60/120/180 Hz upconversion** (KeithR)

## Data set reduction:

- **Time to reassess w.g. needs (Input requested - soon)** (GregM)

## Veto strategy:

- **Frequency-dependent amplitude consistency** (StefanH)

## Agenda

### Round table on

- Ensuring capture of DQ info from elog (call for volunteers !!!)
- Preparing detchar white paper (need to finish by July)
- Support for H2 Astrowatch<sup>+</sup> program?
- Urgent needs for S5 analysis / running?
- Big needs for S6?