Summary of Detector Characterization Sessions

Keith Riles (University of Michigan)

LIGO Scientific Collaboration Meeting
LIGO Hanford Observatory
March 19-22, 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_mar06.html

DC Session Highlights

Calibrations, Timing, and Injections:

• S4 calibration: final uncertainties & draft document; S5 calibration in good shape (BrianO)

• S5 calibration coefficents available through January 2006 (GabyG)

• S4 high frequency (FSR) calibration under study (RickS)

• S5 timing stability very good (± 3µs) – small modulations (SzabiM)

• S5 injections running smoothly (VukM)

Data Quality:

• Now using full database for S5 DQ storage (many thanks to Duncan Brown) – Improved automation – many flags defined, but more needed (JohnZ)
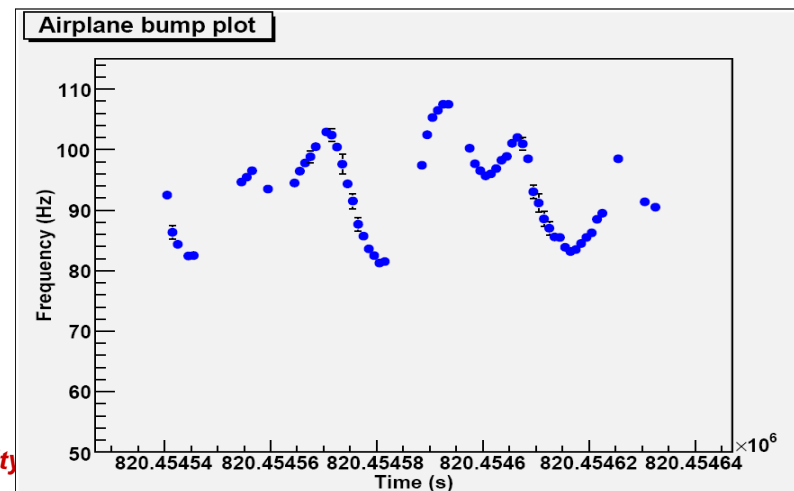
DC Session Highlights

DMT improvements:

- **S5 infrastructure much improved over S4 (JohnZ)**

- **PulsarMon – Crab FOM now more reliable & new FOM's (GiovanniS)**

- **NoiseFloorMon – Non-stationarity of noise floor now trended (SomaM)**

- **BicoViewer & BicoMon improvements (SteveP)**

- **PlaneMon – Airplane monitoring refined (EvanG)**
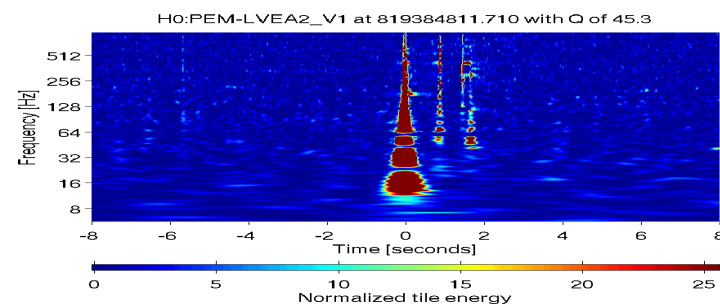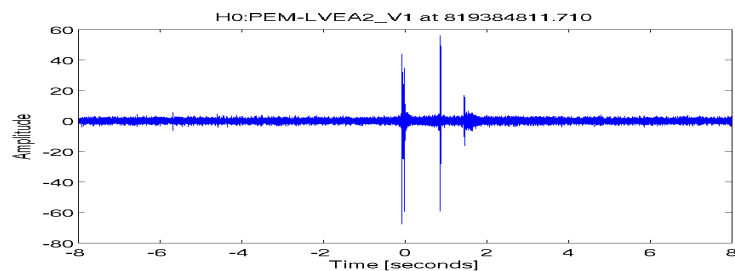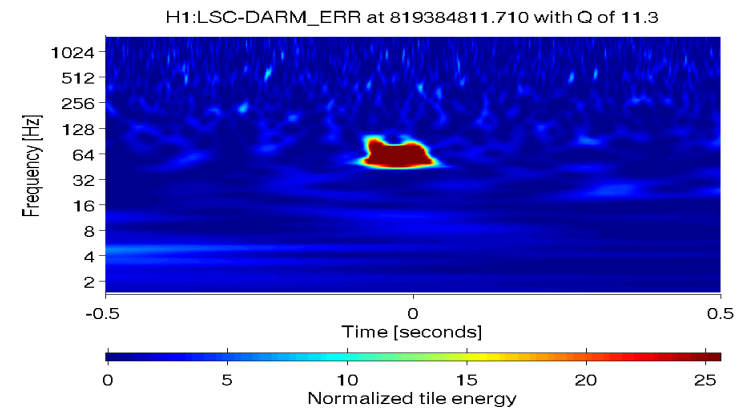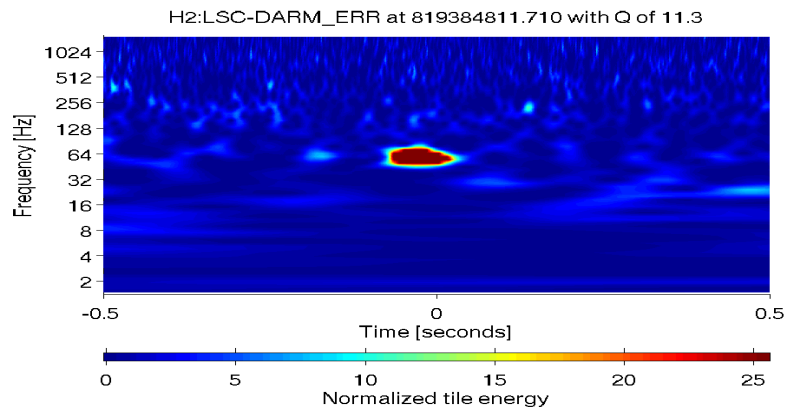

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DC Session Highlights

S4/S5 Glitch investigations:

• **Glitch Group has been wonderfully productive in finding a zoo of artifacts in S5 data and alerting commissioners**

  • **Overview (LauraC)**

  • **KleineWelle Studies (ErikK)**

  • **Q Scan Tool (ShourovC)**

  • **Loud Block-Normal Triggers & Event Display (ShantanuD)**

  • **Online Inspiral Glitch Triggers – links in elog (DuncanB)**

  • **AS_I Veto for S4 Inspiral Analysis – effective at SNR~25 (JakeS)**

H1-H2 coincidence analysis

- Correlations between the H1-H2 instruments result to coincidence events above the Poisson background

- Coincidence analysis and event classification has provided evidence of events accompanied (resulting?) by extreme power line glitches reflected all across the H1-H2 instruments
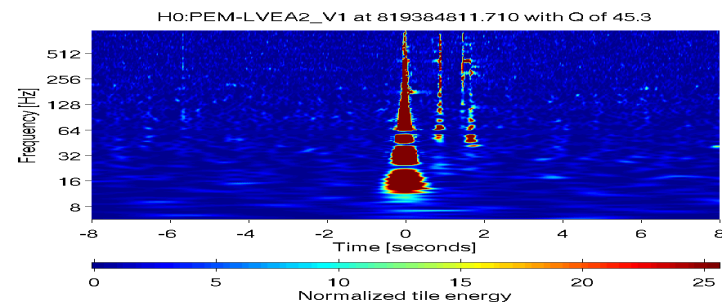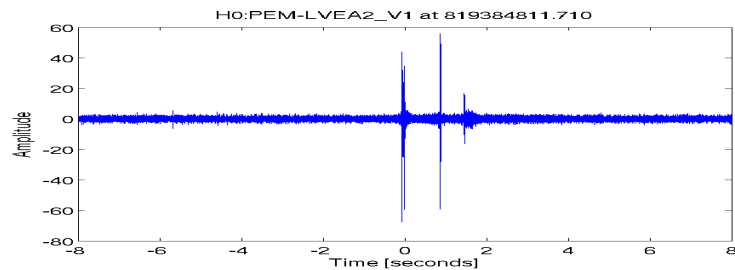
- http://ldas-jobs.mit.edu/~lindy/qscan/h1h2/819384811.71/index.html

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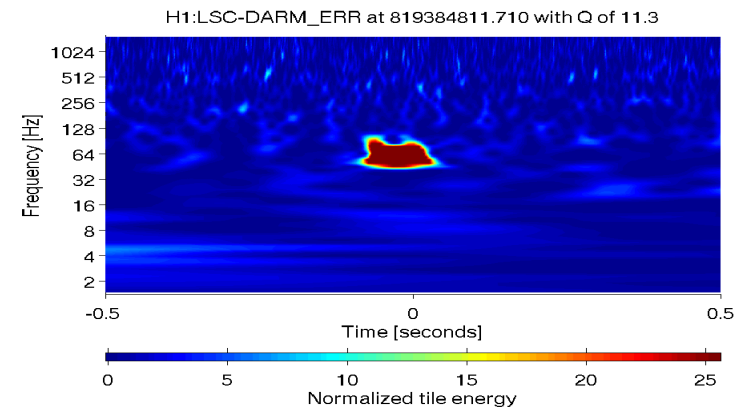
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Q Scan sees injections too…

10 M$_{solar}$ x 10 M$_{solar}$ Inspiral at 40 Mpc

"Raw"

High-SNR planes
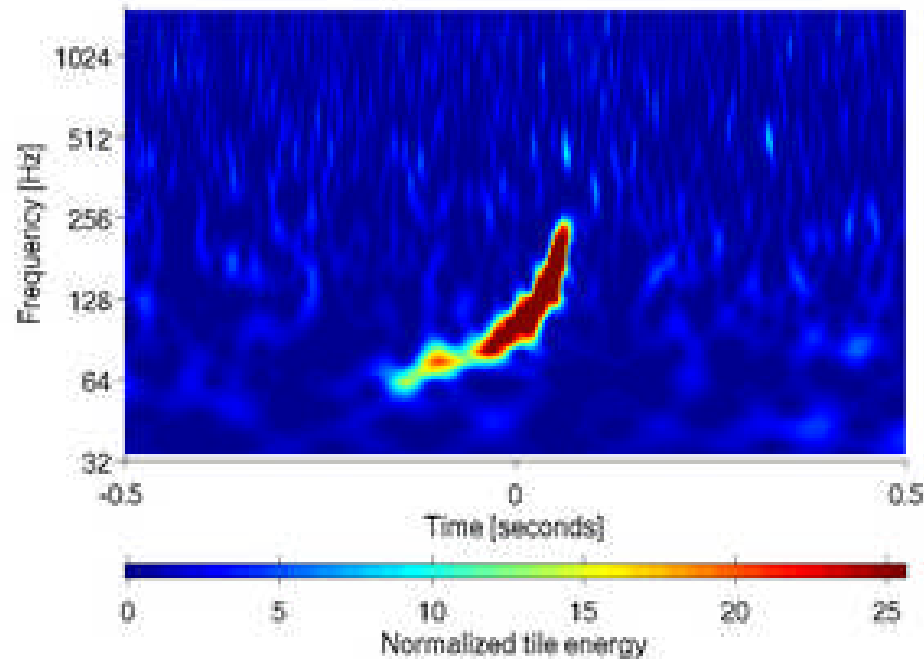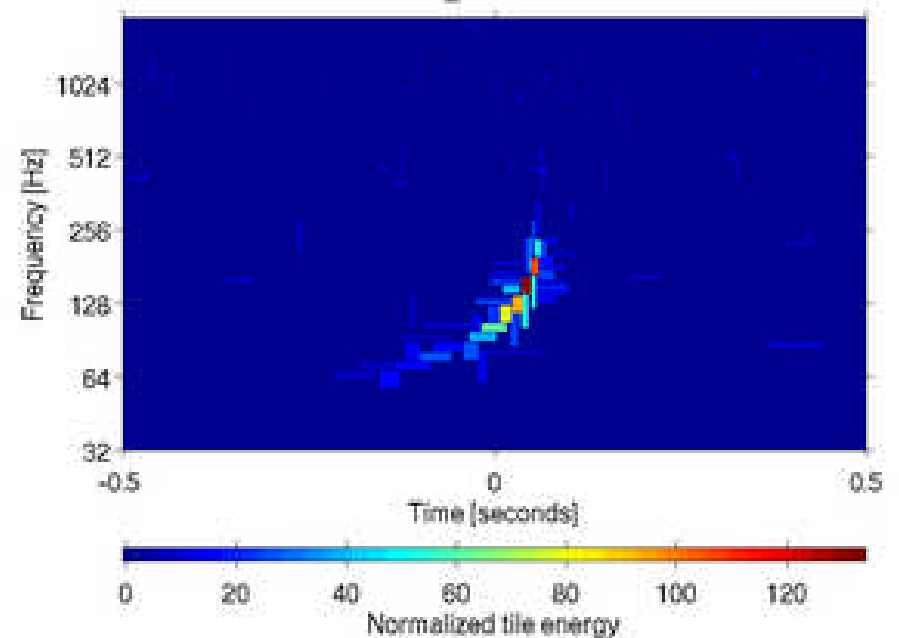
DC Session Highlights

Environmental disturbances & lines:

- **S5 spectral line catalog – many lines already mitigated (KeithT)**

- **Magnetic correlations between the Observatories (BernardW)**

- **PEM mitigation / commissioning (HVAC!) (RobertS)**

Flow from turbine ~50 mph

es - University of
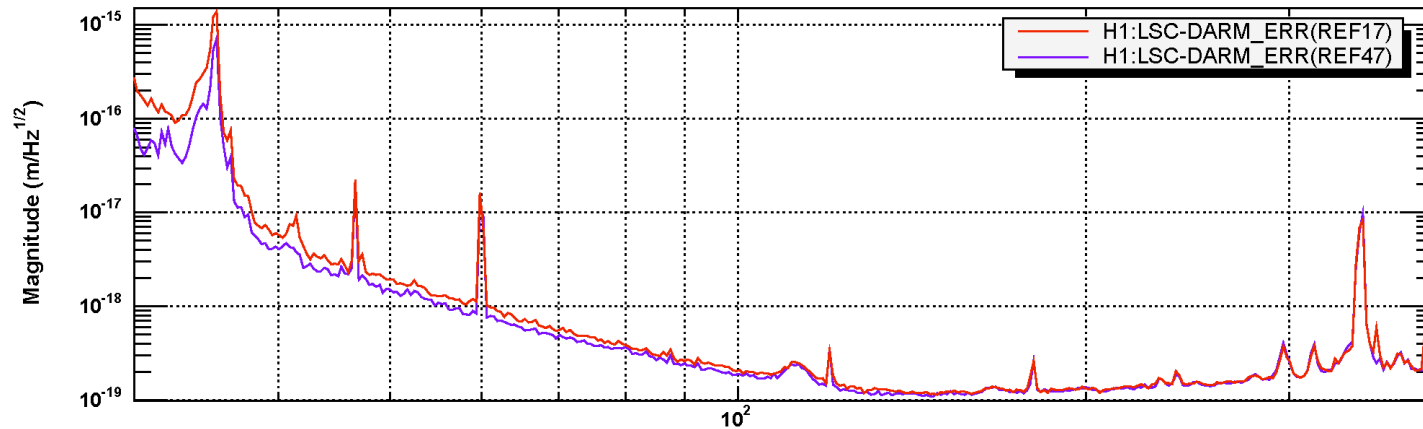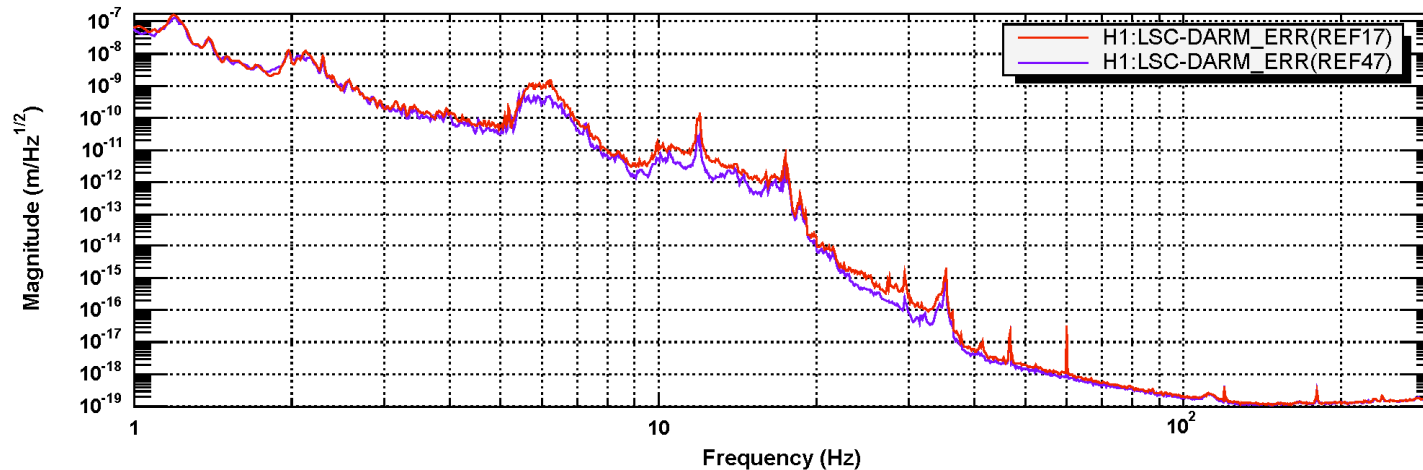
Gravitational wave sensitivity improves when HVAC off

Power spectrum

Blue: All site turbines and chiller pad equipment off; Red: normal

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DC Session Highlights

Algorithm development:

• **GEO Event Projection for burst vetoes (P.Ajith)**

• **Spherically Invariant Random Process Data Modelling (VincenzoM)**

→ **Will be interesting to see these techniques applied to LIGO/GEO data**

Lessons from Scimon Forum

Strong messages:

• **Better training needed for novices → Will organize 1 or more camps**

• **Giving scimons "missions" would make them more effective (assignments from commissioners and/or analysis groups → mechanisms in place but not well used)**

• **Teaming up small groups for scimonning would be useful**

• **Many benefits (not just better scimonning) would come from LSC stationing of postdocs & students at observatories for extended times**

Remarks

Impressed by the quality of presentations at this meeting

Impressed by the rapid feedback from S5 offline analysis studies

→ **Special kudos to the formidable Glitch Group**

And to its proud-new-parent leaders: **Laura + Alessandra & Erik !**

Newest Glitch Group member:

Filippo Di Credico Katsavounidis

(starts scimon training in June…)

Filippo