



---

# New Glitches seen in Block-Normal since March meeting

Shantanu Desai

Pennsylvania State University

for

Glitch Working Group and many others

Detchar session

July 2007 LSC meeting



# Outline of Talk

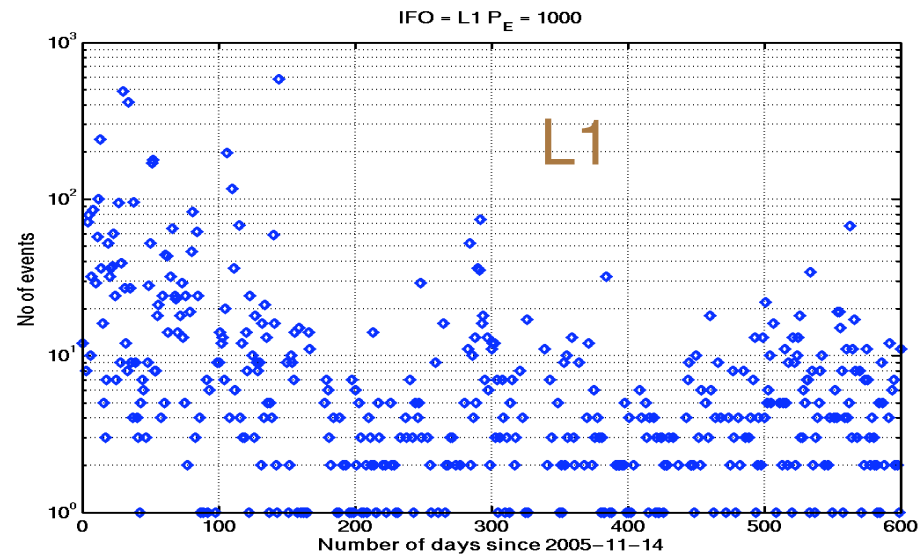
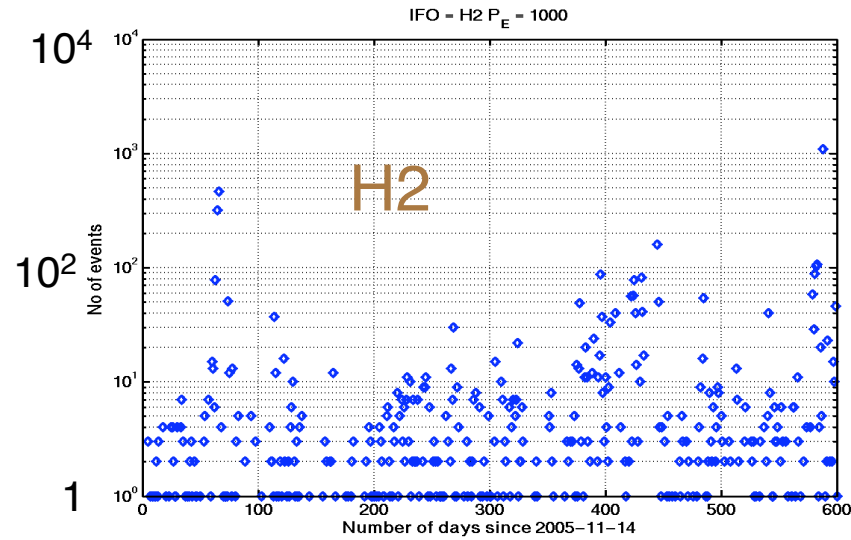
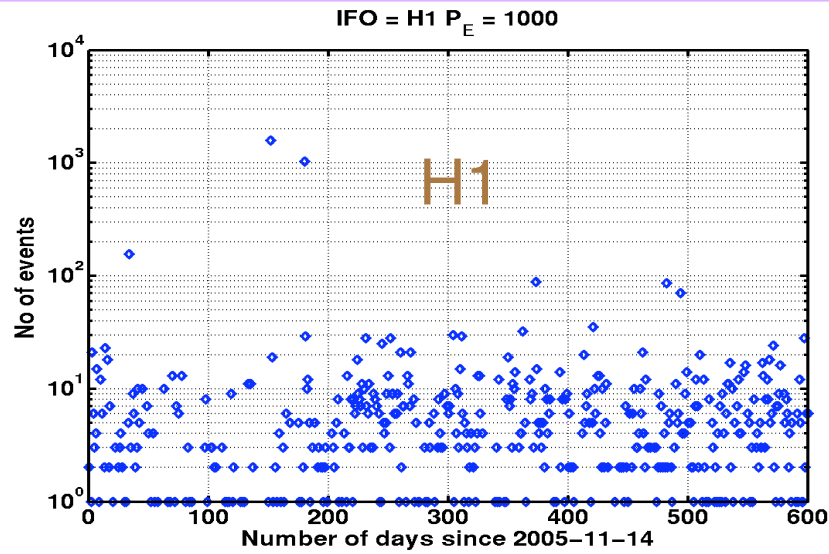
---

- Glitch Trend since S5 start (*Rai / Sergey's question last meeting*)
- New glitches seen since March 07 meeting which do not have a DQ flag yet.
- Followup of previously identified glitches.
- Conclusions

**This talk will focus only on “glitches” -> events with Block-Normal power threshold  $> 1000$  and inspiral events with SNR  $> 25$**



# S5 Glitch Trend from Block-Normal



G070498-00-Z

$10^3$

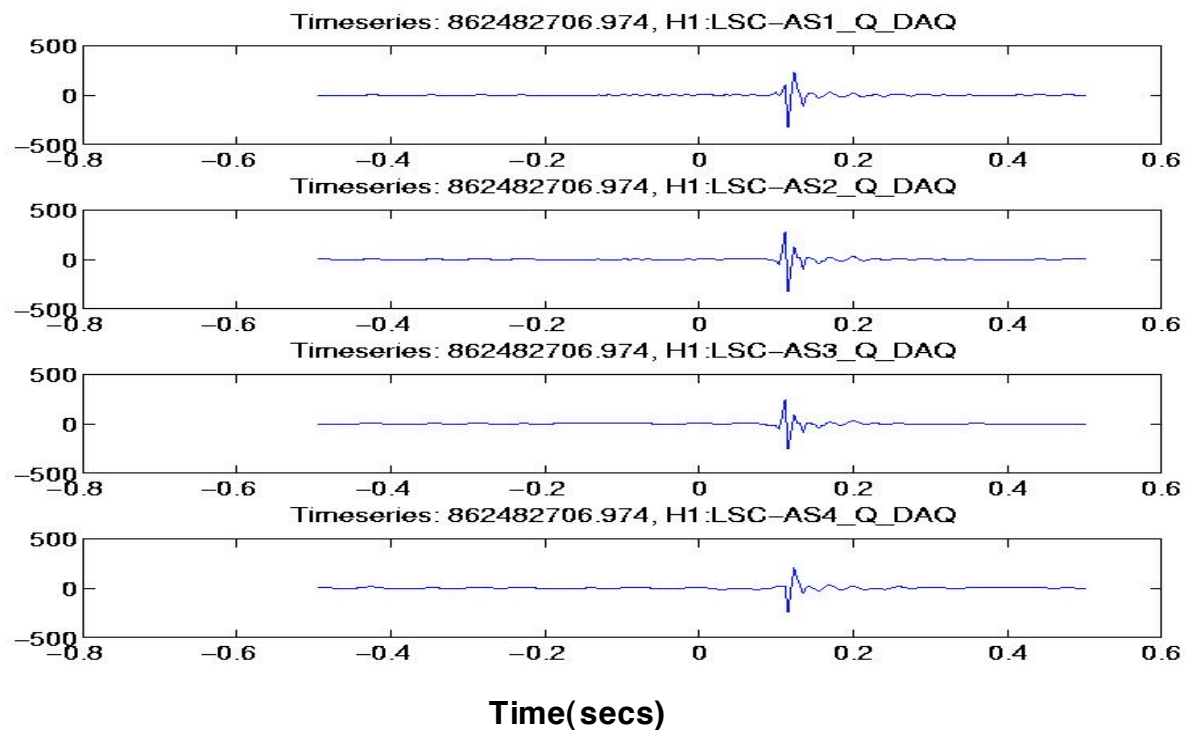
1

3



# (Possible) Dust Glitch

- Look for differences in the 4 photodiode signals (*R. Schofield, R. Adhikari*).
- Most extreme case: signals from PD1,4 inverted w.r.t PD 2,3  
(Consistent with expected behavior from dust glitch) (*R. Schofield*)

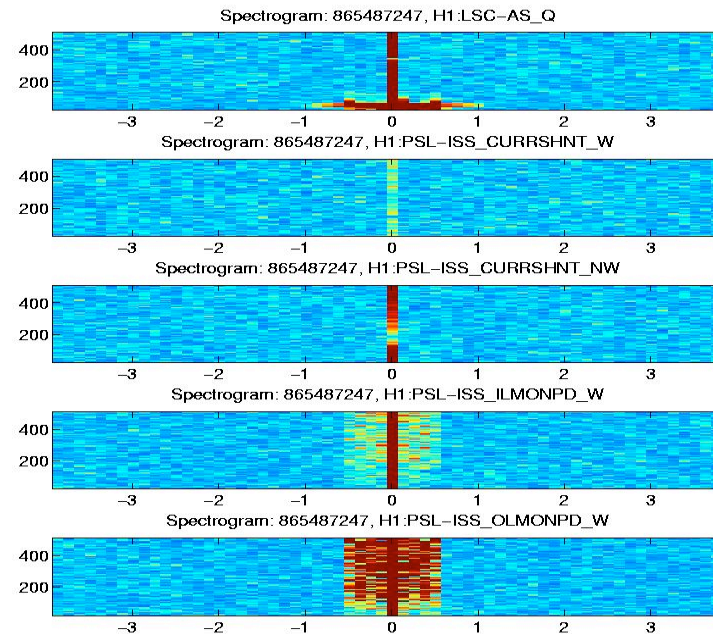
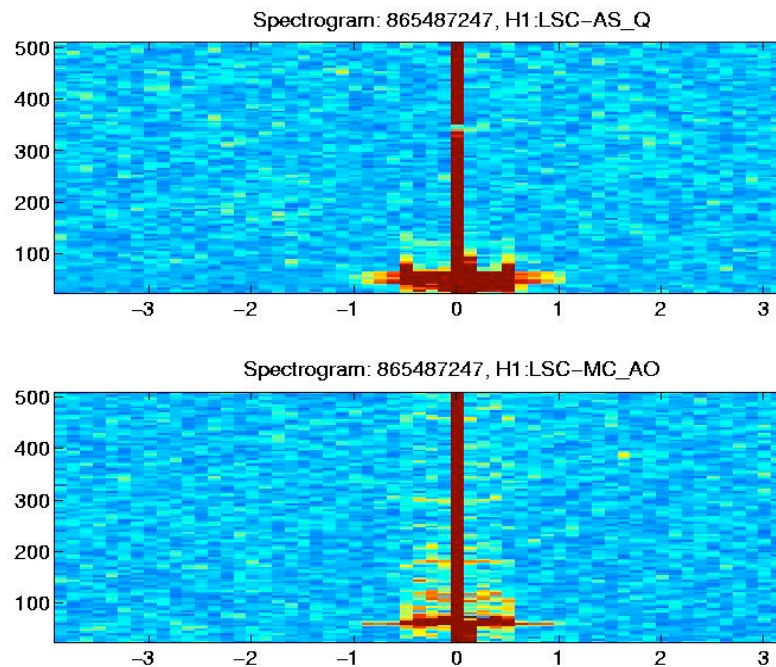


Monitors set up by  
J. Zweizig,  
R. Grosso,  
S. Chatterjee



# H1 ISS glitch (different from before)

- Glitch seen in LSC-MC\_AO besides various ISS channels.

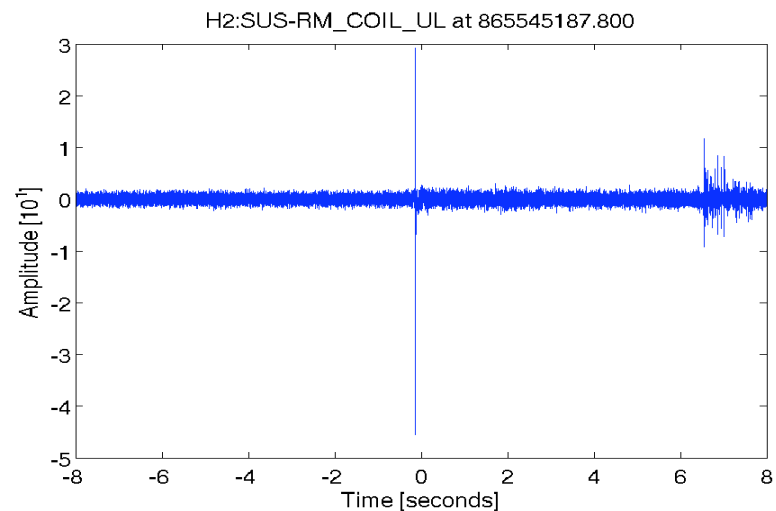
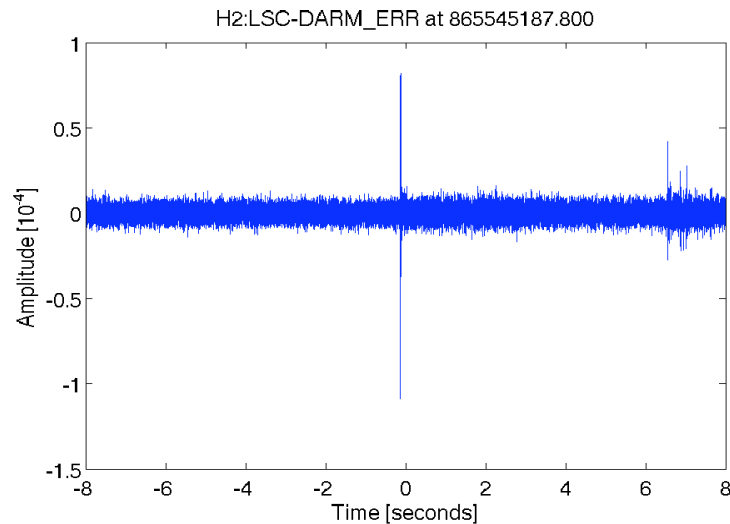


- Current shunt did not saturate. ISS-ILMON\_W and ISS-CURRSHNT\_W move in same direction, unlike last year's ISS glitches (K. Kawabe)



## H2 RM\_COIL\_UL

- Evidence of coherence between RM\_COIL and AS-Q causing extended range drop. (K. Kawabe, etc)
- Sharp glitch seen in H2:SUS-RM\_COIL (during first instance of range drop) and also FMX\_COIL

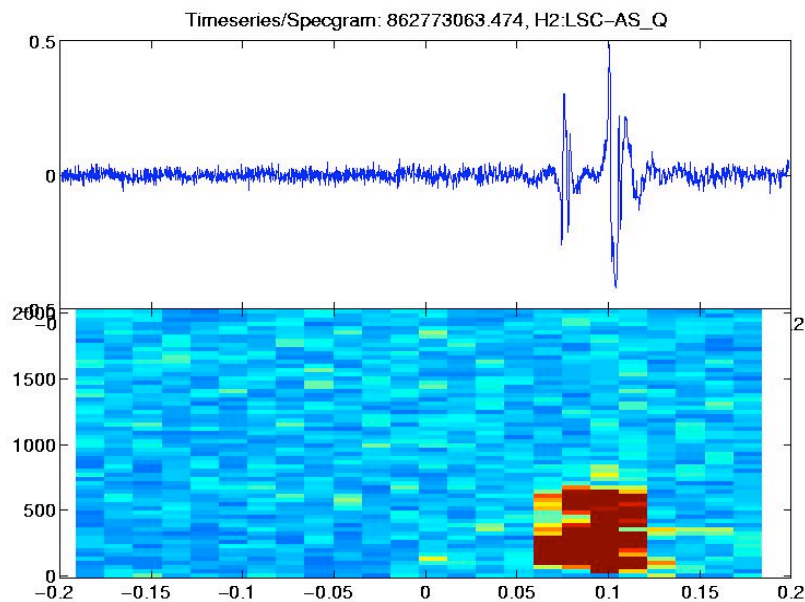


- Problem fixed last week (bad connection or back plane of bias module<sub>6</sub>?)

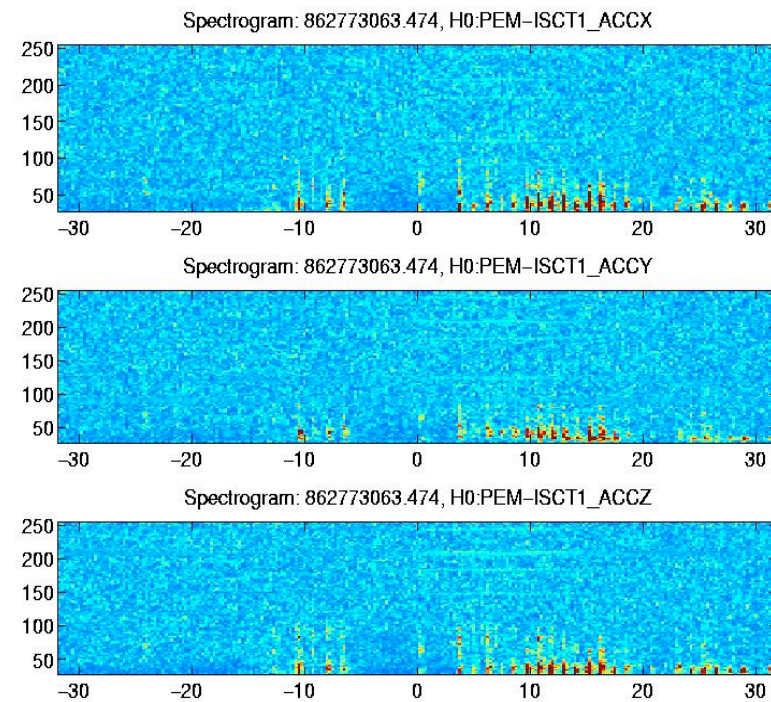


# Onsite (LHO) activity

- Large number of Block-Normal glitches seen during moving around of equipment at LHO during science mode . (Look at activity flag status for such glitches.)



The plot made 13-May-2007 16:35:16



The plot made 13-May-2007 16:52:54

- Signatures seen in accelerometer channels

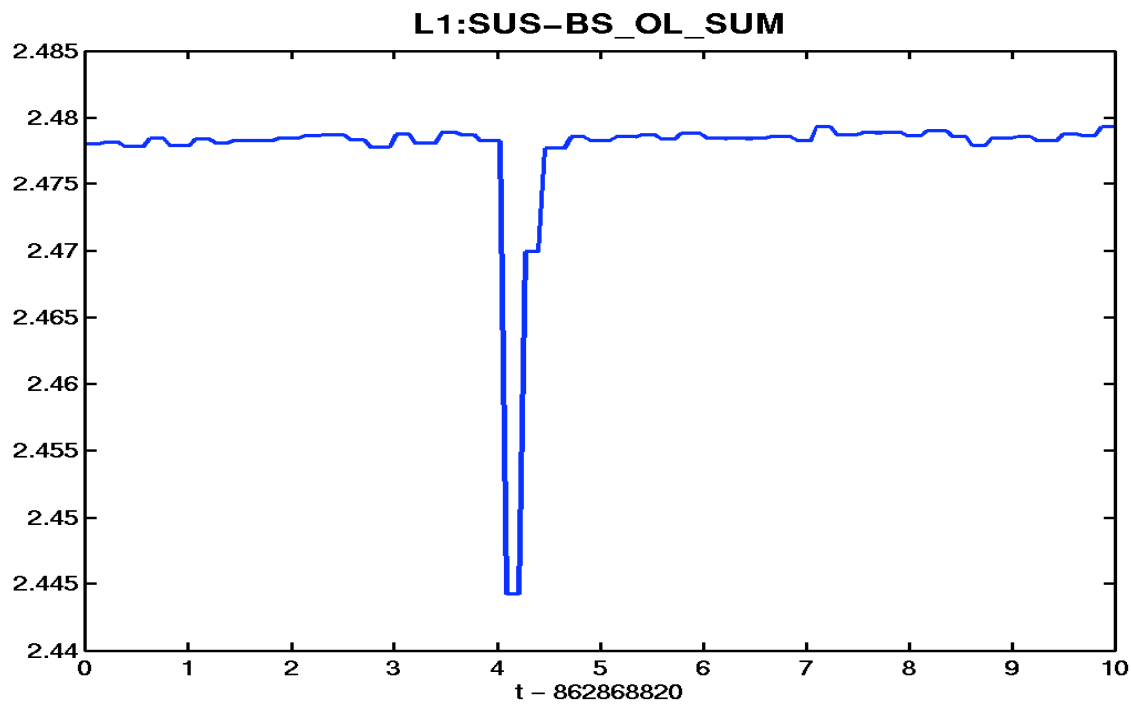
G070498-00-Z





## LLO BS Optical Lever

- Such glitches have been observed in H2 and DQ flagged (G. Gonzalez)
- Similar glitches seen in BS optical lever at LLO causing many DARM glitches . Eventually laser was replaced



Sharp drop  
Seen in OL\_SUM  
during such  
Glitches.

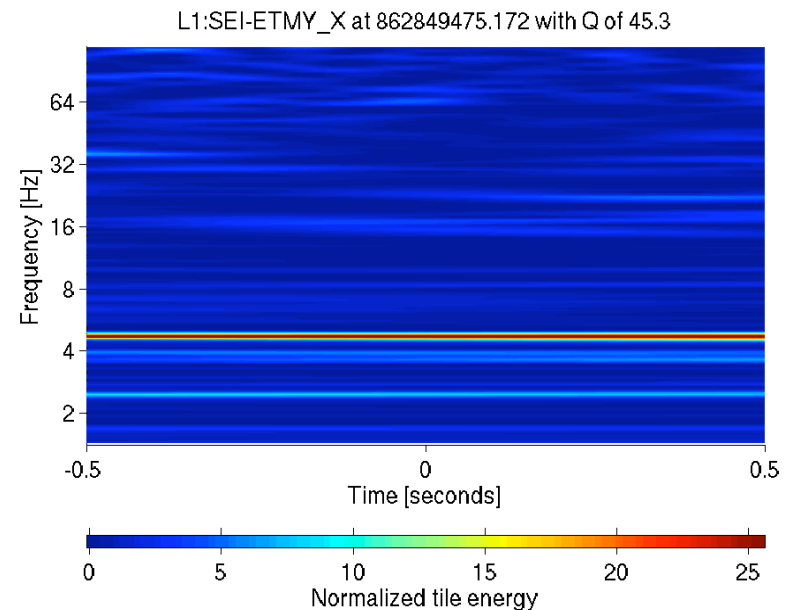
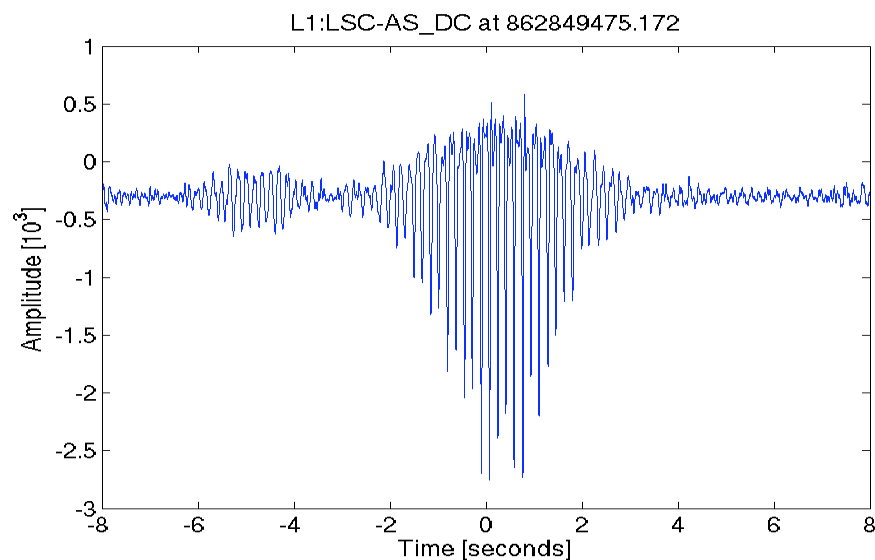




# LLO seismic (different incarnation)

D. Hoak

- Extended oscillations in AS-AC and AS-DC.
- They occur during the day and are seen in HEPI channels ( $\sim 4$  Hz)

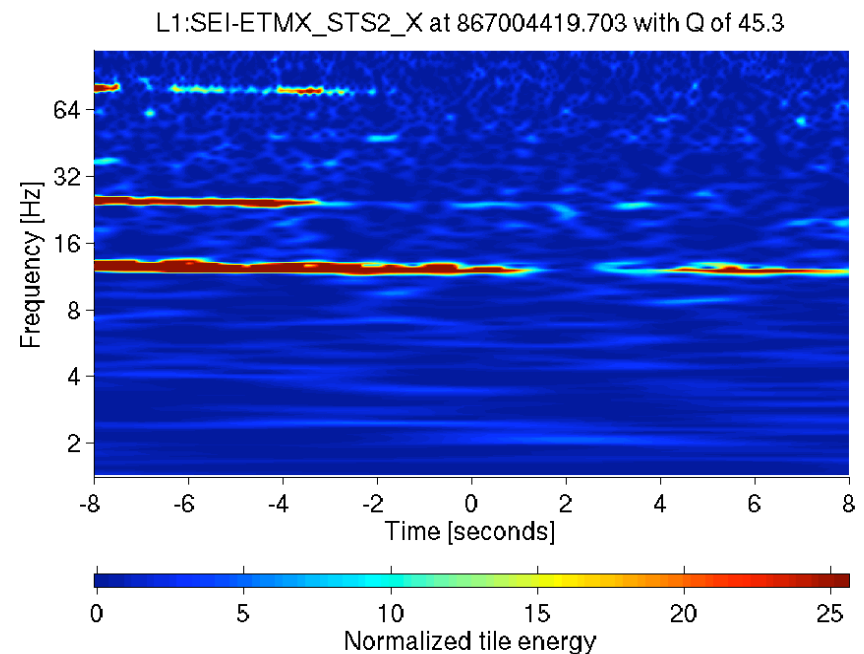
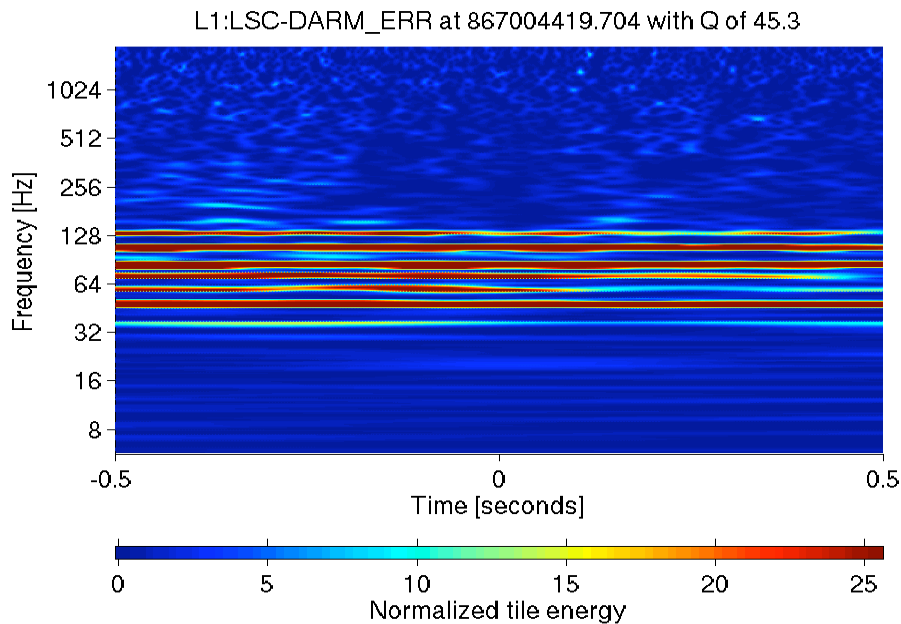




# LLO seismic (another incarnation)

J. Kissel, G. Gonzalez, J. Zweizig, D. Hoak

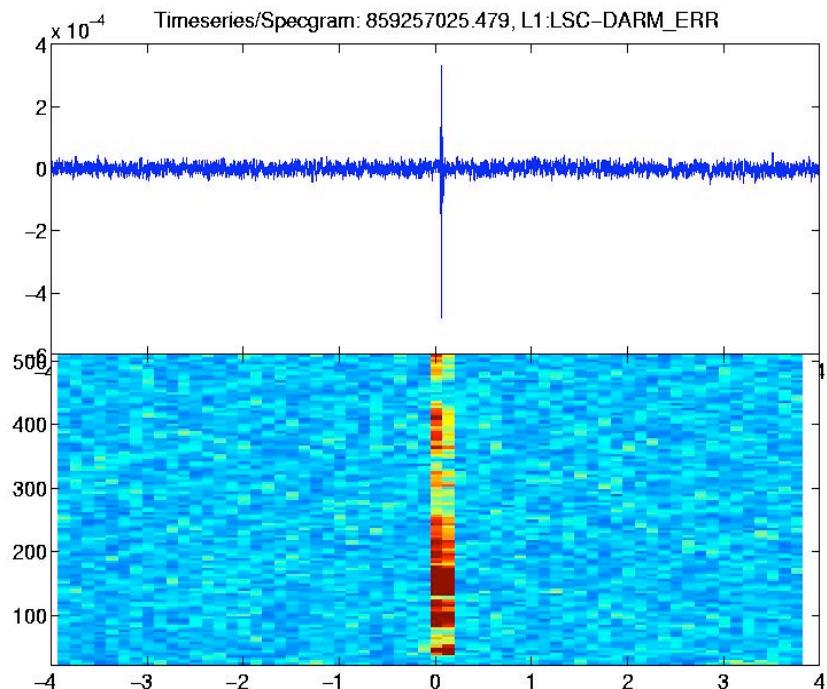
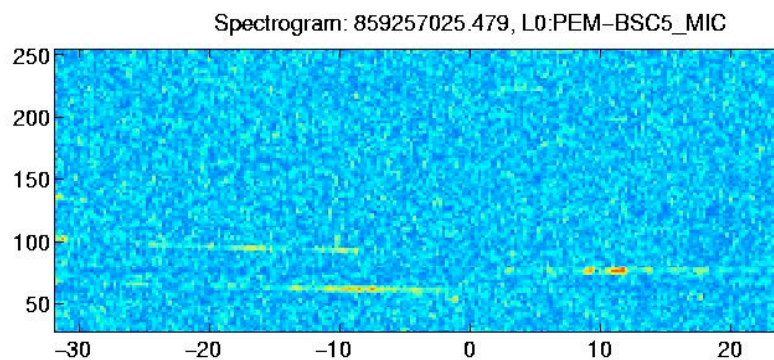
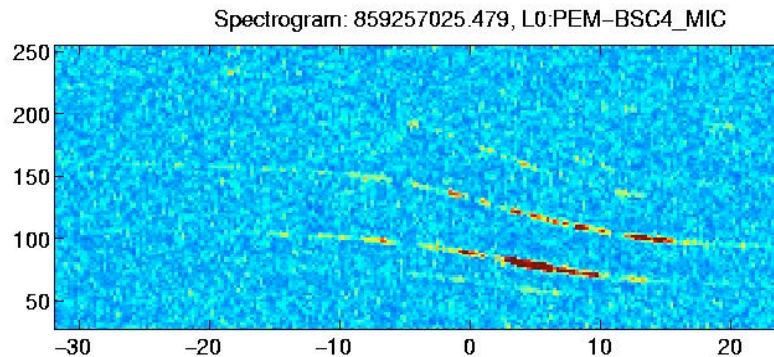
## Harmonics of roll mode



Harmonics seen even in the seismometers. Probably something more than the excited roll modes.



# LLO microphones with multitones



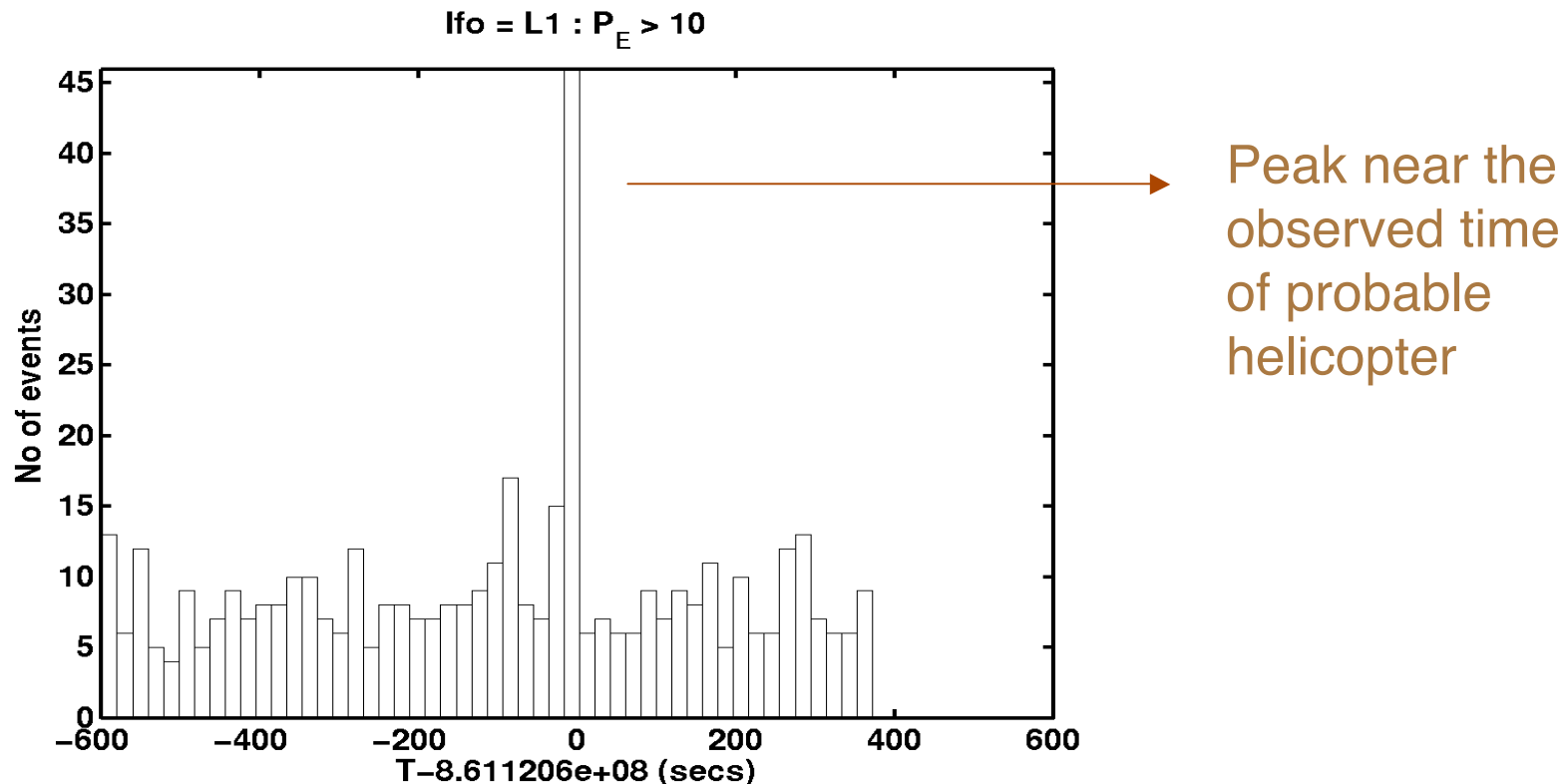
This plot made 31-Mar-2007 13:54:40

This plot made 31-Mar-2007 13:51:28

- Probably a helicopter event (P. Shawhan)
- 3 such events spotted in S5. Not detected by PLANEMON  
Could this be a chance coincidence?



## LLO microphones (contd)



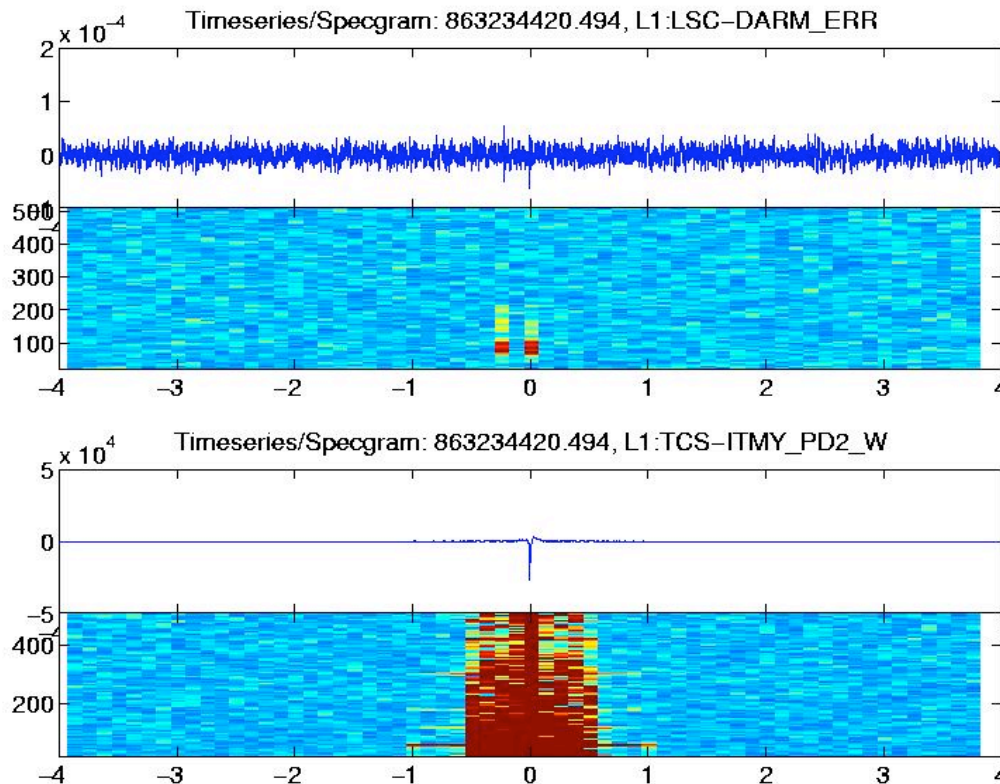
- Helicopter (or whatever else causes multi-tone features) does affect DARM

(Cheryl found an example of helicopter in LHO affecting DARM-ERR in H1 and H2 around 86908907 and multi-tone structure in BSC\_MIC) <sup>12</sup>



# LLO TCS glitches

- Does LLO TCS glitch and do mode hops in LLO TCS laser affect DARM (similar to LHO)?



This plot made 15-May-2007 21:46:46

G070105-00-Z

Yes they do, but corresponding DARM-ERR events lower amplitude than at LHO.

Need to look at second trends to create DQ flags  
Because of non-existence Of relevant L1 TCS channels in Level-1 RDS



## Conclusions

---

- Since last LSC meeting , few more things we can check up on any potential high significance events from analysis in case of no DQ flag.
- No DQ flags on some other events mentioned in last LSC meeting talk (eg. tidal servo saturations, awg crash.).
- However we still don't have any idea of the cause of many of our glitches.
- Probably not a problem for analysis.
- Followup/study of glitches takes lot of effort. Because of long science run and short attention span, its becoming hard to catch up/keep track of large number of glitches .