



LSC glitch group report

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for the LSC glitch group

LSC/Virgo meeting
2007 October 24
Hannover, Germany

- Goals
 - Investigate data quality for burst and inspiral searches
 - Rapid feedback to operators and commissioning teams
 - Contribute to the definition of data quality flags and vetoes
 - Provide guidance on the use of data quality flags and vetoes in the burst and inspiral searches
- Organization
 - [glitch group home page](#)
 - Subgroup of the LSC detector characterization committee
 - Off-site analysis of all of S5 covered in 3-4 day shifts
 - Collect and summarize data from many online resources
 - Weekly glitch teleconference to discuss most recent shifts
 - Report to weekly S5 and detector characterization calls
 - Interact with burst and inspiral groups through joint members

- Many people have contributed to the glitch group:
L.Blackburn, L.Cadonati, S.Caudill, S.Chatterji, J.Dalrymple, S. Desai, A.DiCredico, J.Garofoli, R.Gouaty, L.Goggin, G.Gonzalez, A.Gretarsson, D.Hoak, E.Katsavounidis, J.Kissel, S.Klimenko, A.Mercer, S.Mukherjee, S. Mohapatra, F.Raab, K.Riles, P.Saulson, R.Savage, R.Schofield, P.Shawhan, J.Slutsky, R.Stone, M.Zanolin, N.Zotov, J.Zweizig
- These people bring expertise from many groups
 - burst group
 - inspiral group
 - operators
 - commissioning
- There is much to do, more help is always welcome!



Example shift report

Shift schedule and report July/Sept 2007 (13/13) - Mozilla Firefox

http://www.lsc-group.phys.uwm.edu/cgi-bin/glitch-enote.pl?nb=glis5shift&action=view&page=13

172	20070701 / 20070705	---	Link
173	20070705 / 20070708	---	Link
174	20070708 / 20070712	---	Link
175	20070712 / 20070715	---	Link
176	20070715 / 20070719	Shantamu	Report
177	20070719 / 20070722	romain	Link
178	20070722 / 20070726	romain	Link
179	20070726 / 20070729	anonymous	Link
180	20070729 / 20070802		Link
181	20070802 / 20070805		Report
182	20070805 / 20070809	Sarah	Link
183	20070809 / 20070812	Sarah	Link
184		Shourov	Link
185		Michele	Link
186		Jeff K	Link
187	20070823 / 20070826	Shantamu	Report
188	20070826 / 20070830	Robert Stone	Link
189	20070830 / 20070902	Gaby	Link
190	20070902 / 20070906	Jeff K	Link
191	20070906 / 20070909	Gaby	Link
192	20070909 / 20070913	Soma	Link
193	20070913 / 20070916	Laura/Satya	Link
194	20070916 / 20070920	romain	Link
195	20070920 / 20070923	Laura	Link
196	20070923 / 20070927	Laura	Link
197	20070927 / 20070930	Michele	Link

Example shift report

197 shifts over almost 2 years (~70 scimon shifts per person!)

Glitch Shift Sep 16 2007 16:00:00 UTC - Sep 20 2007 16:00:00 UTC - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://lsc.phys.lsu.edu/romain/glitchReport/glitch_report-20070916-20070920.html

Glitch Shift Sep 16 2007 16:...

Summary

- General**
 - On Sep 18, Keith Riles posted an entry which shows the list of frequency lines found by the powerFlux pulsar search program run over the 1st year of S5. These lines are found to be coincident within 10 mHz between H1 and L1. [Here](#) is the elog entry.
 - Kleine Welle plots from Sep 18 and Sep 19 are missing for L1.
 - Many Block Normal and Inspiral events in L1 with oscillations in AS_DC, AS_AC. They look similar to the ones observed by Shantanu in July ([wednesday call report](#))
- Report for day beginning Sep 16 2007 16:00:00 UTC (873993614 - 874080014)**
 - H0: 21:00-24:00 UTC: sensemon range affected by high winds.
 - H1:
 - H2: Hump noise (range 60-200 Hz) before a lock loss at 22:00 UTC. This was the same problem as the one described [there](#). This noise is coherent with POB and RM UL coil.
 - L1: 2 lock losses due to earthquakes (at 00:28 and 08:18 UTC).
- Report for day beginning Sep 17 2007 16:00:00 UTC (874080014 - 874166414)**
 - H1:
 - H2:
 - L1:
- Report for day beginning Sep 18 2007 16:00:00 UTC (874166414 - 874252814)**
 - H1:
 - H2: A TCSY laser glitch was observed by Cheryl Vorvick ([elog entry](#))
"H2 TCSY laser power started behaving bad mid way through shift causing some glitchiness on the range. Once its laser head temperature got tweaked, it got better."
 - L1:
Tuesday maintenance: Jeff Kissel and Brian O'Reilly made an attempt to measure the REFL_I calibration.
After the maintenance, it was not possible to acquire the science mode until 21:00 UTC due to high environment noise.
At the end of the shift the sensemon range was again affected by high environmental noise.
- Report for day beginning Sep 19 2007 16:00:00 UTC (874252814 - 874339214)**
 - General: at about 08:50:27 UTC, the 3 ifos were taken out of science mode by an earthquake in Indonesia (Mag 6.6)
 - H1:
 - H2:
 - L1: At the end of the shift, the duty factor was affected by an earthquake in Indonesia (out of science from 9:09 UTC to 11:48 UTC).

Summary of major daily events
which may impact glitchiness

Done

start | glitches | GLITCHES.ppt | GLITCHES [Recov... | Glitch Shift Sep 1...

5:00 PM

Glitch Shift Sep 16 2007 16:00:00 UTC - Sep 20 2007 16:00:00 UTC - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://lsc.phys.lsu.edu/romain/glitchReport/glitch_report-20070916-20070920.html

Glitch Shift Sep 16 2007 16:...

From the E-logs:

- LHO [09/16/2007](#) [09/17/2007](#) [09/18/2007](#) [09/19/2007](#)
 - H1 science segments:

Segment	Start	Stop	Duration	Description
3808	873991118	873994945	3827	Reboot of h0ifomon (see elog)
3809	873997297	873997521	224	
3810	873998175	874098318	100143	During this segment, H2 lost lock at 874023772 due to an earthquake, whereas, H1 stays in science mode at ~15:00 UTC (Sep 17): "H1 & H2 range has dipped due to a reactor core delivery" End of segment: AS-trigger due to a garbage truck
3811	874098444	874132569	34125	During this segment: "The 4K suffered a range dip from seismic. (H1_SenseMonitor_CumLog.txt, Lock loss from seismic origin
3812	874133371	874162758	29387	seismic or ended for maintenance
3813	874181009	874181608	599	Back in science mode after maintenance AS-trigger due to helicopter
3814	874182099	874187787	5688	Ended by the operator for commissioning
3815	874188389	874193687	5298	ended for LVEA access
3816	874194343	874227038	32695	"A 2.1 earthquake mid Montana caused lock loss"
3817	874227308	874263347	36039	During this shift: "A glitch occurred ended by the operator for commissioning probably ended by seismic spikes
3818	874267336	874272890	5554	ended by a seismic spike (11-3Hz sitewide)
3819	874274080	874275440	1360	"accidentally ended by tp excitation"
3820	874276365	874283453	7088	ended by earthquake in Indonesia
3821	874283533	874313466	29933	
3822	874314647	874316940	2293	
3823	874318403	874340680	22277	
 - H2 science segments:

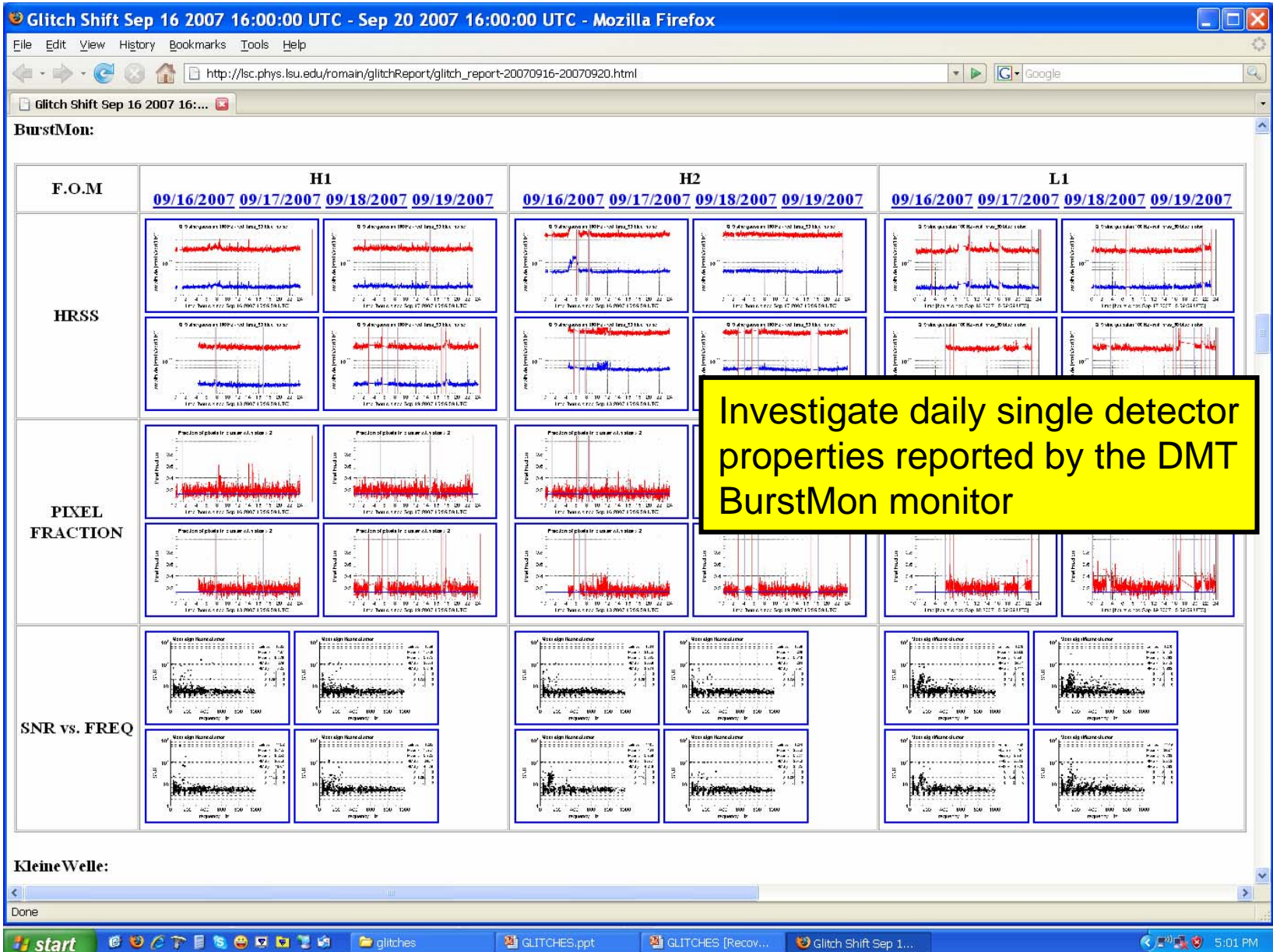
Segment	Start	Stop	Duration	Description
3174	873991118	873995566	4448	Reboot of h0ifomon (see elog)
3175	873998207	874015313	17106	Operator broke lock to fix the hump noise in the frequency range 60-200 Hz. Same problem as t
3176	874016595	874023772	7177	Loss Lock form an earthquake (Virgin Islands)
3177	874024251	874087561	63310	During this segment, operator mentioned: "H1 & H2 range has dipped due to a reactor core deli End of segment: "possibly due to a truck", or wind
3178	874088911	874162775	73864	
3179	874182367	874186345	3978	Ended by the operator to fix TCS
3180	874187038	874187786	748	Ended by the operator for commissioning (scattering coupling investigation)
3181	874188391	874189126	735	"Ended by 'bump' - seismic?"
3182	874189114	874189368	2574	"ended with H1 3815" (for LVEA access)

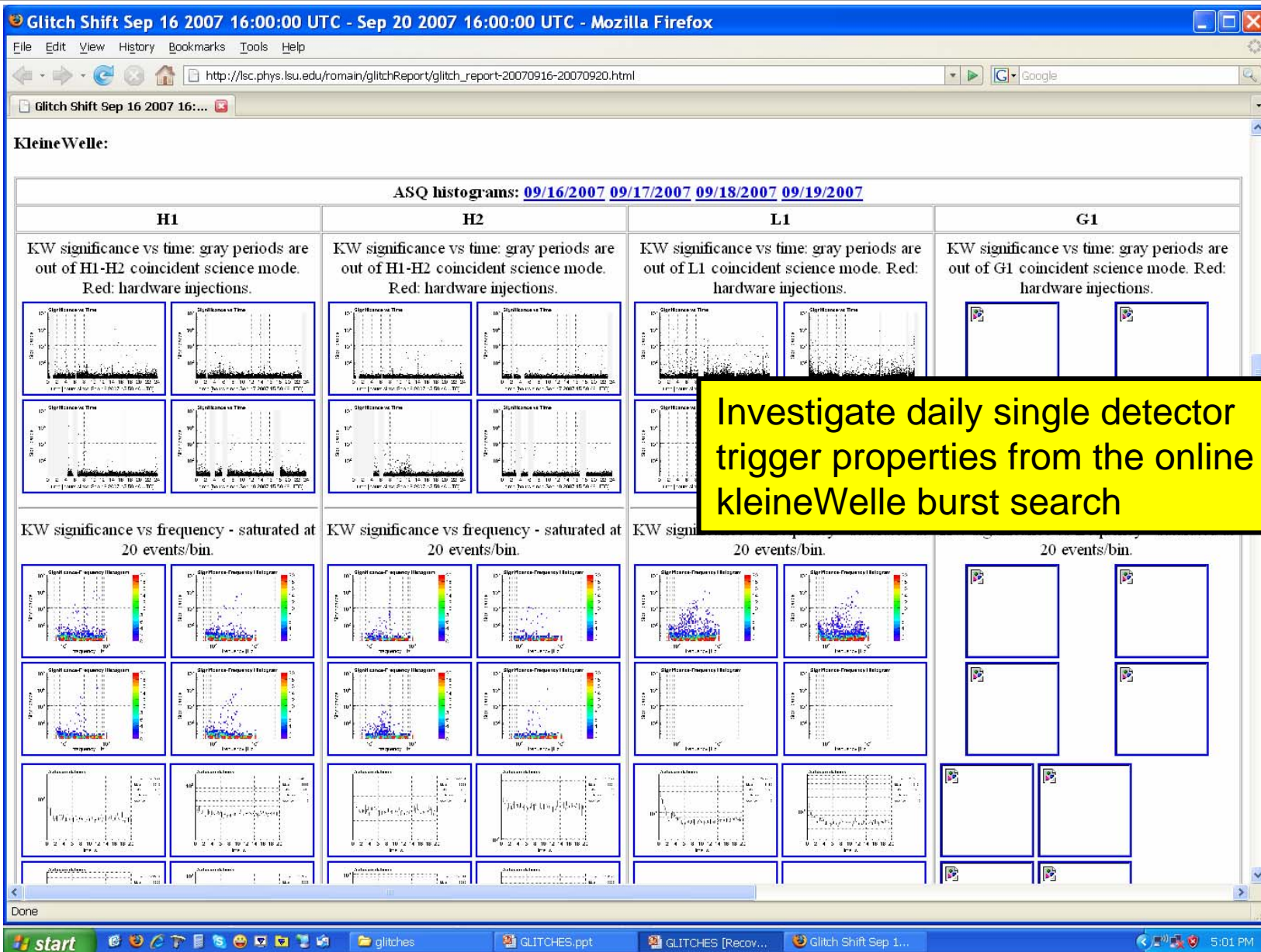
Done

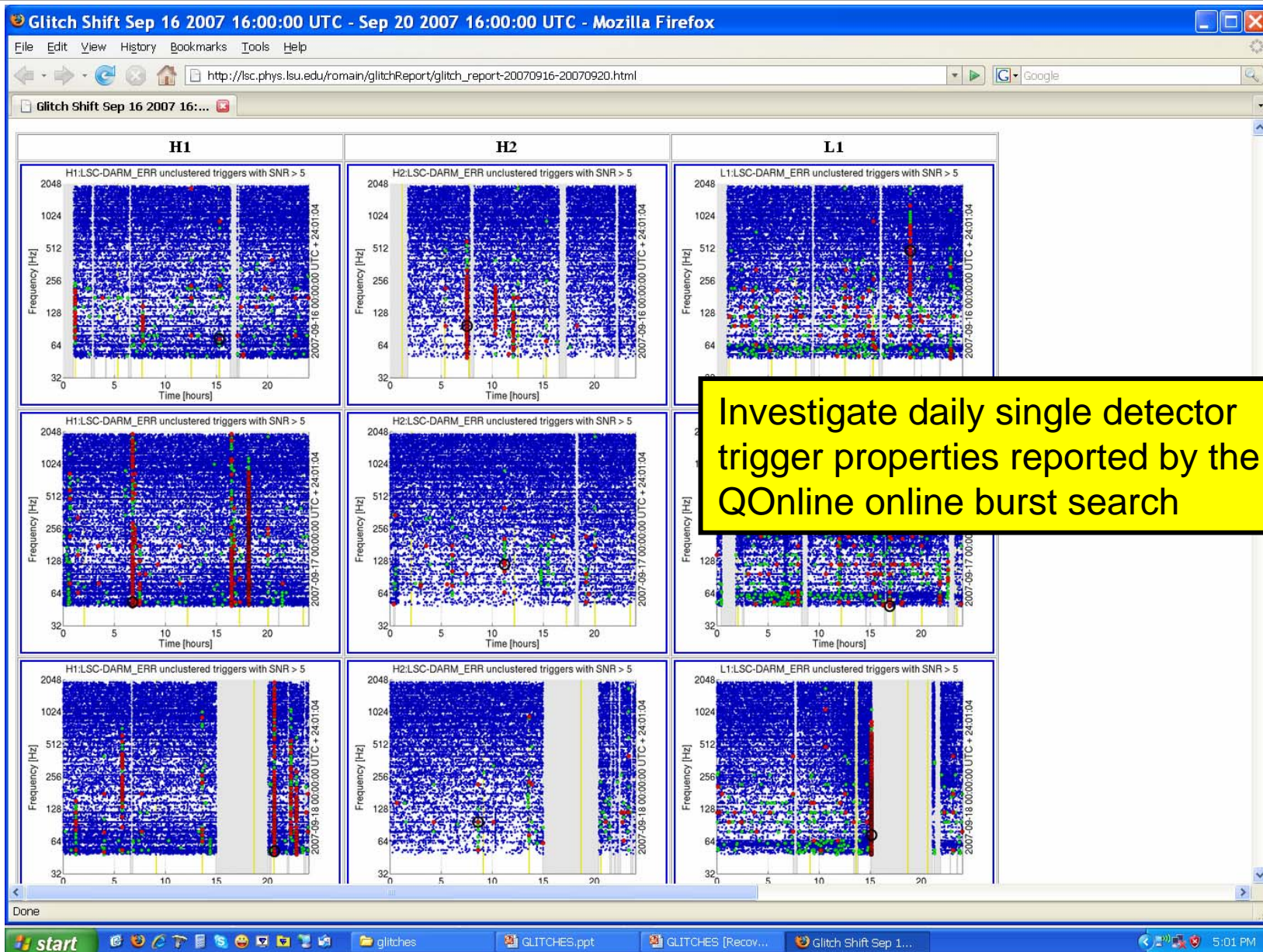
start | glitches | GLITCHES.ppt | GLITCHES [Recov... | Glitch Shift Sep 1...

5:00 PM

Summarize data quality issues and cause of lock loss for each science mode segments







Glitch Shift Sep 16 2007 16:00:00 UTC - Sep 20 2007 16:00:00 UTC - Mozilla Firefox

http://lsc.phys.lsu.edu/romain/glitchReport/glitch_report-20070916-20070920.html

H1H2L1 zero-lag KleineWelle coincident event (significance>10)

eventID	Tstart[s]	Dur[s]	H1lag[s]	H2lag[s]	L1lag[s]	H1fc [Hz]	H2fc [Hz]	L1fc [Hz]	H1signif	H2signif	L1signif	Qscan	Comment
<u>09/16/2007</u>													
<u>09/17/2007</u>													
1	874115522.273	0.039	0.000	0.000	0.000	1024	256	0	21.1				<p>The 3 ifos have very different frequencies.</p> <p>No obvious cause for H1</p> <p>For H2, AS_AC, AS_DC, and POY_DC look a bit suspicious (low frequency glitch). A</p>
<u>09/18/2007</u>													
2	874143241.477	0.027	0.000	0.000	0.000	64	1024	0	19.1	21.0	21.7	Qscan	<p>LVEA-MAGZ (60 Hz) are comparable. However Robert's coupling factor predicts $X \sim 2.6 \times 10^{-5}$ in DARM, whereas it is only 3.0×10^{-6}.</p> <p>No obvious cause</p>
3	874154192.133	0.023	0.000	0.000	0.000	128	256	0	17.1	20.7	20.9	Qscan	<p>No obvious cause for H1 and H2</p> <p>The H0:PEM-MX_V2 still VERY glitchy (plot) (probably not relevant ?)</p> <p>About 1.5 s earlier, a glitch is visible in H2:LSC-REFL_DC (plot). Does it look like an electronic glitch ?</p> <p>For L1, the LSC and ASC channels look suspicious. A seismic glitch is found at the EX station at that time.</p>

Done

start | glitches | GLITCHES.ppt | GLITCHES [Recov... | Glitch Shift Sep 1...

5:04 PM

Investigate H1H2 and H1H2L1 coincident events from the online kleineWelle burst search

Glitch Shift Sep 16 2007 16:00:00 UTC - Sep 20 2007 16:00:00 UTC - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://lsc.phys.lsu.edu/romain/glitchReport/glitch_report-20070916-20070920.html

Glitch Shift Sep 16 2007 16:...

BlockNormal Loudest Events

09/16/2007

#	Site	GPS time	Local time	Links	Comments
1	L1	874004181.7305	Sep 16 13:56:07.7305	Event Display Qscan	Large single transient in DARM, with broad frequency range (20-1000 Hz). Found by the online inspiral search with SNR~30. Pretty quiet qscan, apart a low frequency glitch visible in the RADIO_LVEA.
2	H2	874062747.6406	Sep 17 4:12:13.6406	Event Display Qscan	Single loud transient in DARM (range: 40-1000 Hz). VERY QUIET QSCAN. A mystery... This transient is also found by the online inspiral analysis (event #1)

09/17/2007

#	Site	GPS time	Local time	Links	Comments
1	H1	874082526.1133	Sep 17 9:41:52.1133	Event Display Qscan	The t
2	L1	874103747.2305	Sep 17 17:35:33.2305	Event Display Qscan	Data quality flags: L1 ASI CORR OVERFLOW 874103745 -2 874103749 +2 L1 PD Overflow 874103747 +0 874103750 +3 L1 SEVERE LSC OVERFLOW 874103747 +0 874103750 +3 Only 6s before a lock loss (end of segment 6282) Event Display and Qscan show seismic disturbance in all stations (but most of all in LVEA), disturbances in ISCT1 and ISCT4 accelerometers, as well as ISTC4/ISCT1 microphones. This is an environmental glitch.
3	H1	874129641.8958	Sep 17 22:47:07.8958	Event Display Qscan	Loud single transient in DARM, there is no obvious cause. A dip in sensemon range (7.34 Mpc) has been reported at 874129620 (see segment 3811), which is very close to that time. Maybe this trigger is actually responsible for the sensemon dip ?

09/18/2007

Done

start | glitches | GLITCHES.ppt | GLITCHES [Recov... | Glitch Shift Sep 1... | 5:05 PM

Investigate loudest daily single detector events from the online BlockNormal burst search

Event Summary: 874004181.73 - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://gravity.psu.edu/~psurg/events1/event_874004181.html

Glitch Shift Sep 16 2007 16:00:00... Event Summary: 874004181...

Event Summary: GPS time 874004181.73
(Generated by: unknown ETG in interferometer H1H2L1)

Segments

Interferometer	Segment number	Start	End	Duration	Time Elapsed	Time Remaining	Injection status	DQ flags
N1	0	0	0	0	(NA)	(NA)		
H1	2	873998175	874029829	31654	6006	25648	(none)	(none)
H2	1	873998207	874015313	17106	5974	11132	(none)	(none)
L1	10	873994383	874005488	11105	9798	1307	(none)	(none)

Header Information

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+++++
* IFO:           H1H2L1
* Channel:      LSC-AS_Q
* EventType:    unknown ETG
* GPS:          874004181.73
* Tshift (LHO): 0
* Tshift (LLO): 0
                (at Hanford: 874004181.73,
                at Livingston: 874004181.73)
* UTC:          Sep 16 2007 18:56:07 UTC
+++++
    
```

AS_Q Timeseries

IFO	timeseries (+/- 2.5 ms)	timeseries (+/- 200 ms)	timeseries (+/- 4 sec)
H1			
H2			
L1			

Parameter Estimation

IFO	Parameters
N1	
H1	hrss = 0.000188 e-hrss = 0.000668 central freq = 822.823018 bandwidth = 53.248000 t-peak = 874004181.659363 duration = 0.101562 SNR = 0.555055
H2	hrss = 0.000565 e-hrss = 0.050245 central freq = 190.370438 bandwidth = 77.824000 t-peak = 874004181.711487 duration = 0.051636 SNR = 3.083929
L1	hrss = 0.012079 e-hrss = 0.884071 central freq = 255.797279 bandwidth = 270.336000 t-peak = 874004181.711426 duration = 0.001709 SNR = 379.165837

Event displays to investigate other channels at time of an interesting event

Done

gravity.psu.edu

start | glitches | GLITCHES.ppt | GLITCHES [Recov... | Event Summary: ... | 5:07 PM

Glitch Shift Sep 16 2007 16:00:00 UTC - Sep 20 2007 16:00:00 UTC - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://lsc.phys.lsu.edu/romain/glitchReport/glitch_report-20070916-20070920.html

Glitch Shift Sep 16 2007 16:...

L1 loudest inspirals

#	ifo	end_time	end_time_ns	snr	eff_distance	f_final	ttotal	Evt. display	Q scan	DQ flags	Comments
1	L1	874004181	780029296	30.22208	16.07859	776.34198	7.526649	E.D.	Q Scan	Science	same as BN event #1 on Sep 16
2	L1	874018410	249023437	21.890421	22.944639	706.10681	6.7787671	E.D.	Q Scan	Science	Oscillations in AS-AC, AS-DC
3	L1	874163174	408935546	137.121	3.0828259	744.03278	6.9961572	E.D.	Q Scan	Science	Oscillations in AS-DC, AS-AC. Happens about 114 s before lock loss
4	L1	874244511	765869140	17.53977	24.90448	735.68591	7.1023121	E.D.	Q Scan	Science	Oscillations in AS-AC, AS-DC
5	L1	874204155	149169921	27.117479	10.14974	1555.165	24.835541	E.D.	Q Scan		
6	L1	874195581	607421875	16.41814	31.11529	731.57568	6.7957649	E.D.	Q Scan		
7	L1	874333976	94970703	25.57659	6.848567	2103.606	40.915859	E.D.	Q Scan		
8	L1	874338049	209472656	21.091591	19.23904	845.20178	8.707242	E.D.	Q Scan	Science	
9	L1	874329175	614501953	17.036791	16.481291	1073.137	16.915409	E.D.	Q Scan	Science	Happens 6s before BN event #9 on Sep 19, but I did not see any obvious cause for this one.
10	L1	874313521	344482421	434.2554	1.092002	695.94458	6.7494898	E.D.	Q Scan	ASI_CORR_OVERFLOW [874313513,874313514) ASI_CORR_OVERFLOW [874313518,874313519) ASI_CORR_OVERFLOW [874313520,874313524) ASI_CORR_OVERFLOW [874313527,874313528) ASI_CORR_OVERFLOW [874313535,874313538) PD_Overflow [874313521,874313523) PD_Overflow [874313526,874313528)	

Investigate loudest daily single detector events from the online BNS inspiral search

http://ldas-jobs.ligo.caltech.edu/~desai/qscans2/874004181.7305/

start | glitches | GLITCHES.ppt | GLITCHES [Recov... | Glitch Shift Sep 1... | 5:08 PM

Event at 874004181.780029296 - Mozilla Firefox

http://ldas-jobs.ligo-la.caltech.edu/~inspiral/bs/qscans/874004181.780029296/

Glitch Shift Sep 16 2007 16:00... Event at 874004181.780029...

Gravitational wave data

L1:LSC-DARM_ERR ($t = 874004181.772$ s, $f = 5.9 \times 10^2$ Hz, $Q = 5.7 \times 10^0$, $Z = 4.6 \times 10^4$, $X = 3.3 \times 10^{-5}$ Hz^{-1/2})

time series: raw, high passed, whitened | spectrogram: raw, whitened, autoscaled | eventgram: raw, whitened, autoscaled

1024
512
256
128
64
32
16
8
4
2
1

Frequency [Hz]

Time [seconds]

Normalized tile energy

0 5 10 15 20 25

QScans to investigate other channels around the time of interesting events

Calibration lines and injections

L1 length sensing and control

L1:LSC-AS1I_CORR_OUT_DAQ ($t = 874004181.781$ s, $f = 1.6 \times 10^0$ Hz, $Q = 5.7 \times 10^0$, $Z = 2.6 \times 10^4$, $X = 4.3 \times 10^3$ Hz^{-1/2})

time series: raw, high passed, whitened | spectrogram: raw, whitened, autoscaled | eventgram: raw, whitened, autoscaled

10¹
10⁰
10⁻¹

Frequency [Hz]

Time [seconds]

Normalized tile energy

0 5 10 15 20 25

L1:LSC-AS1_I_DAQ ($t = 874004182.031$ s, $f = 4.6 \times 10^0$ Hz, $Q = 5.7 \times 10^0$, $Z = 2.7 \times 10^4$, $X = 9.9 \times 10^{-1}$ Hz^{-1/2})

time series: raw, high passed, whitened | spectrogram: raw, whitened, autoscaled | eventgram: raw, whitened, autoscaled

Done

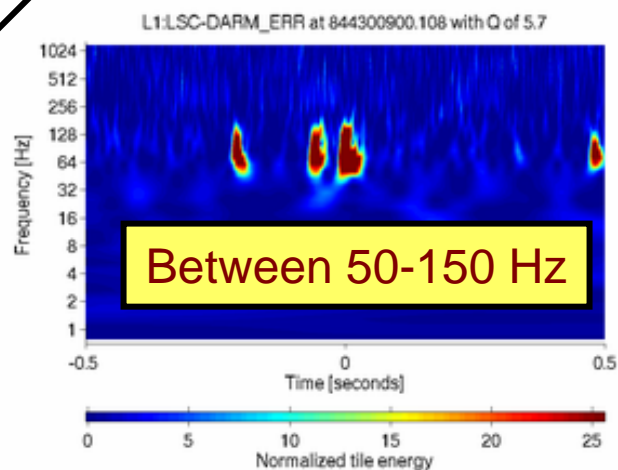
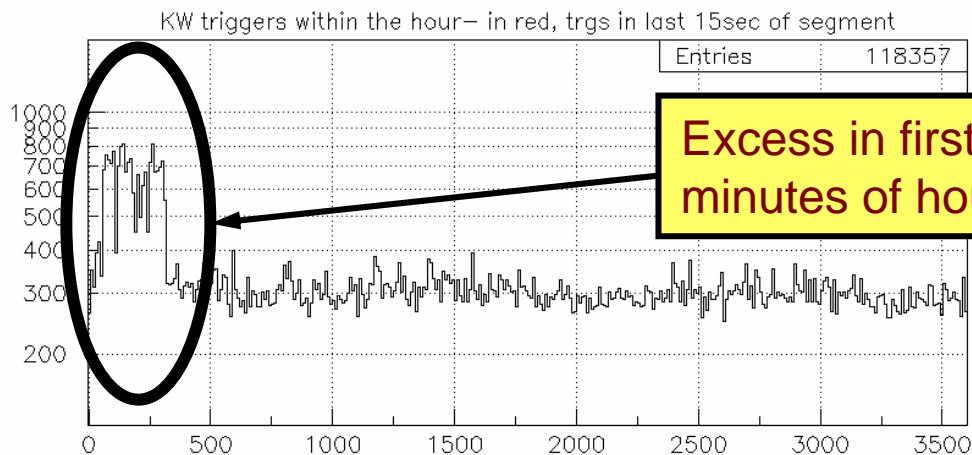
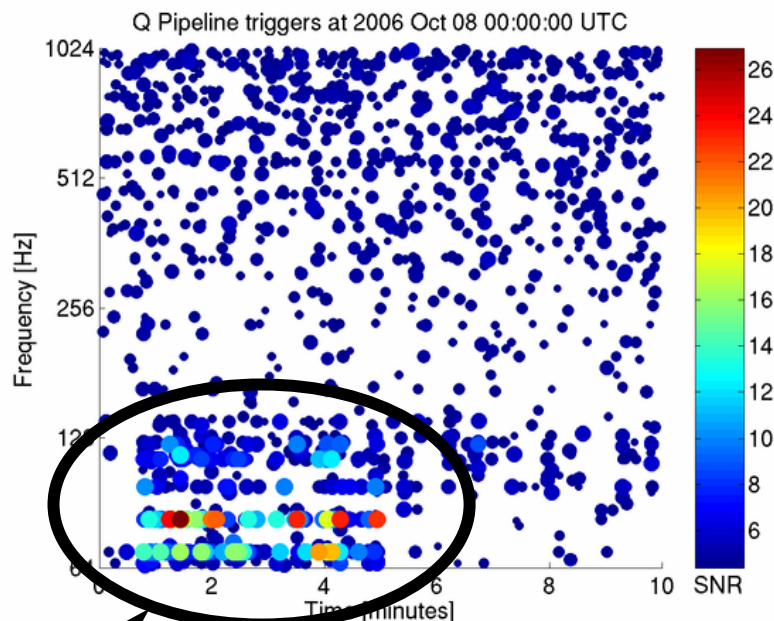
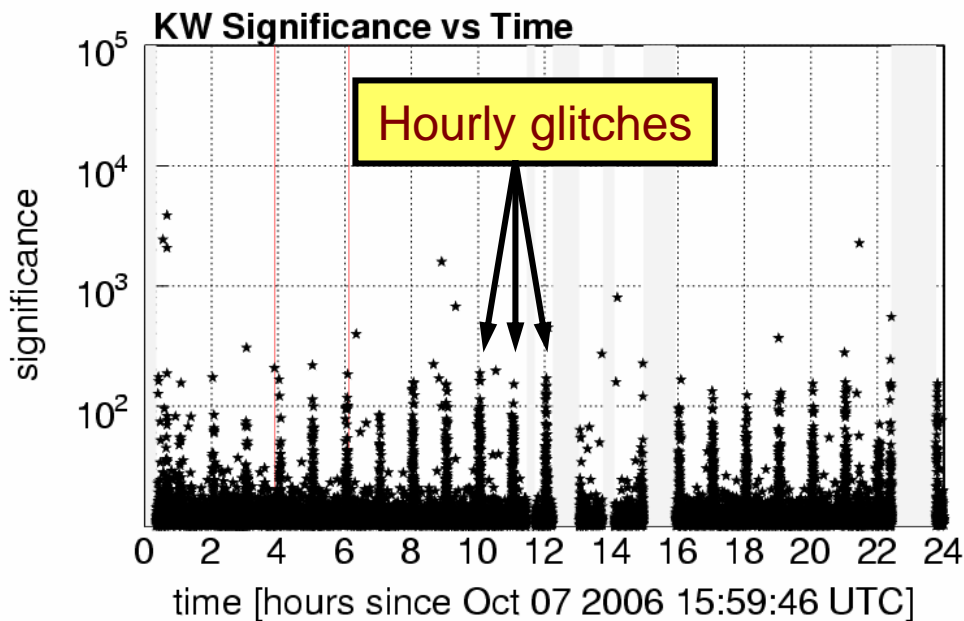
start | glitches | GLITCHES.ppt | GLITCHES [Recov... | Event at 8740041... | 5:09 PM



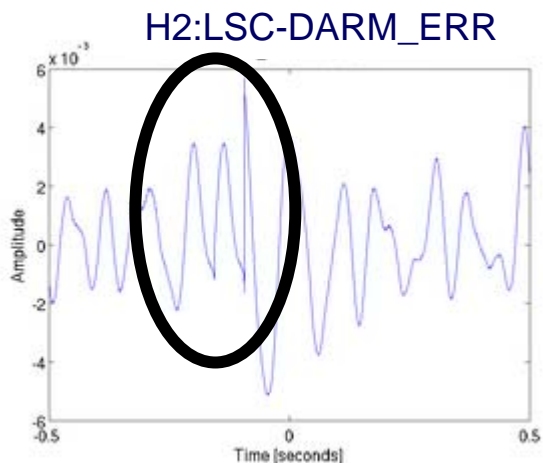
Glitch zoo

Only a small sample...

- Data corruption linked to hourly saving of detector state



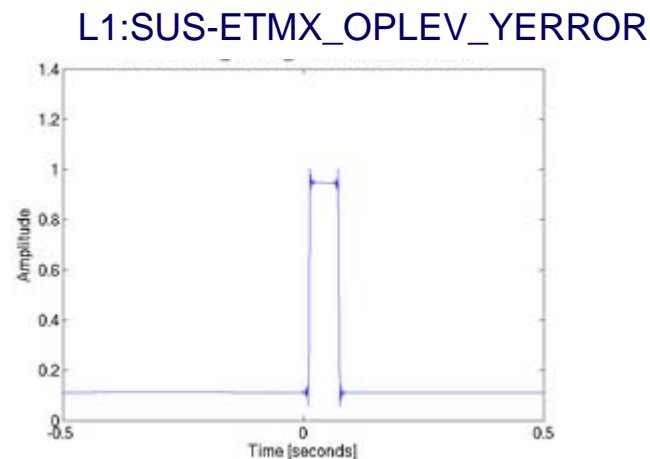
Discussion in the glitch group rapidly identified data corruptions of various flavors, through examination of loudest events...



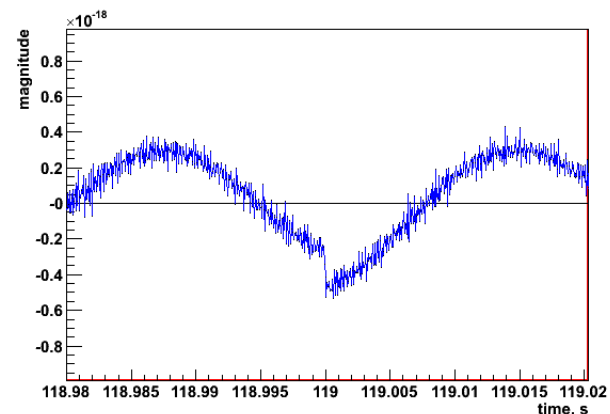
1/16 sec data repeats, inconsistency between fb0 and fb1, found in late march, CHECKSUM_MISMATCH data quality flag

... and helped prompt diagnosis of software artifacts

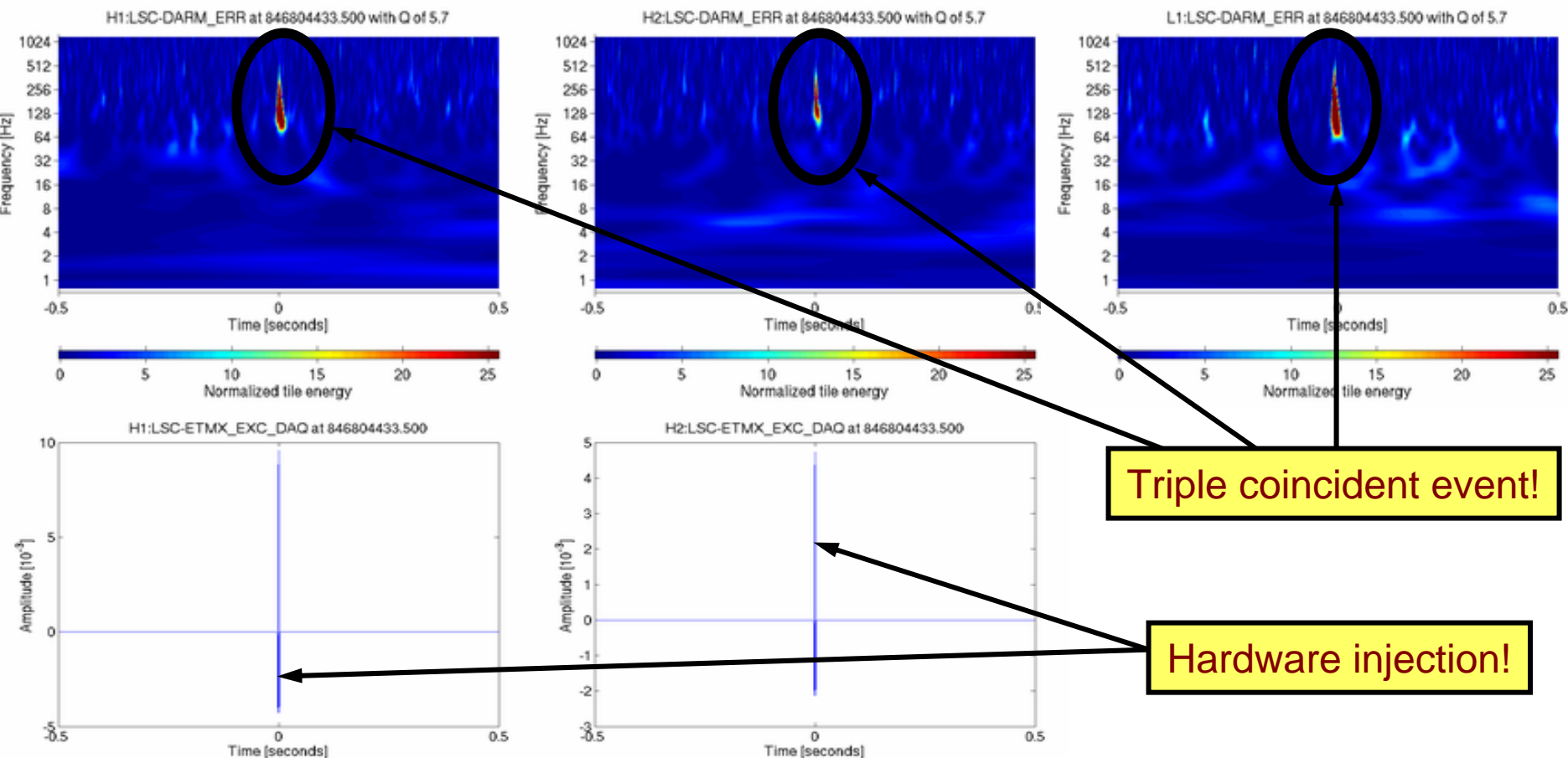
Coherent WaveBurst analysis found glitches like this, on high-passed data, and asked support of the glitch team. Promptly found to be an artifact of the new frame library version v6r20, Frv v4r12



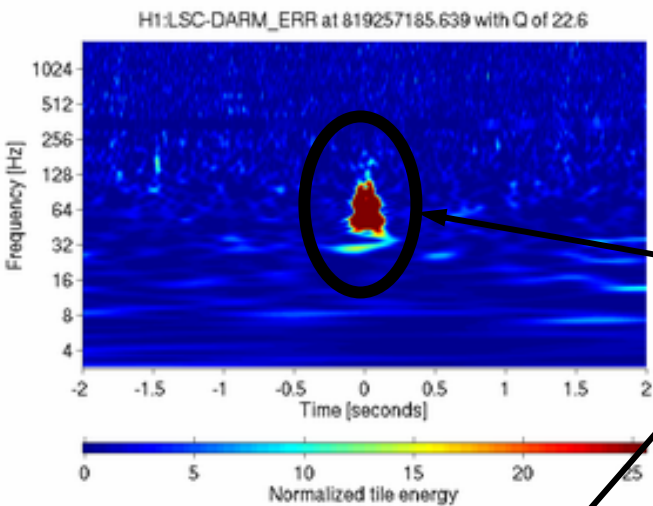
Last week of July, found numerous data valid errors in LLO x-end station channels, likely due to a hardware failure in l1issex, which has been replaced.



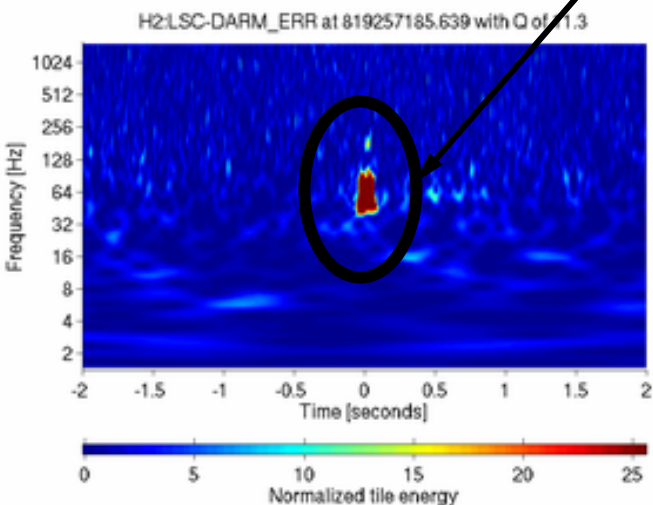
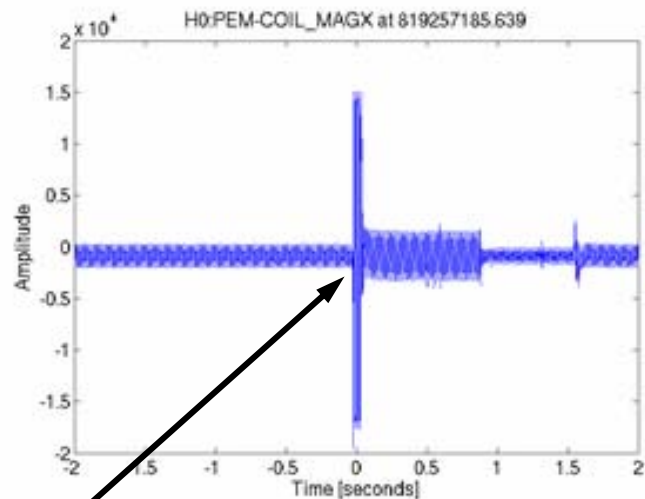
- Failure to record injections in state vector led to “blind” injections
- Immediately noticed in kleineWelle H1H2L1 triggers during glitch call.
- Immediately diagnosed as injections by looking in injection channel.



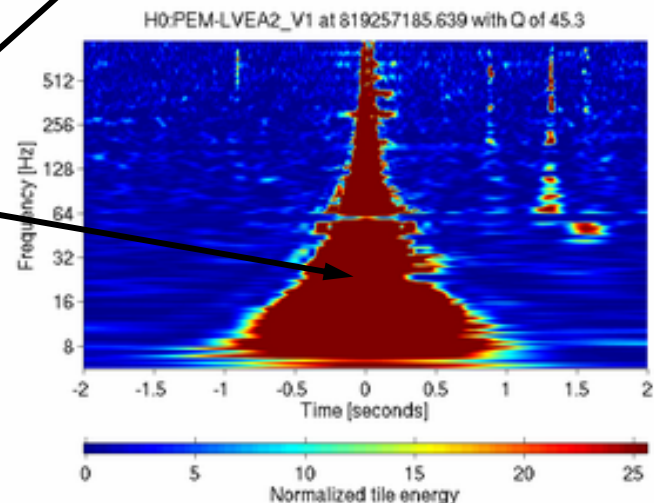
- Large power line glitches produce coincident glitches in H1 and H2
- Led to the development of a new data quality flag

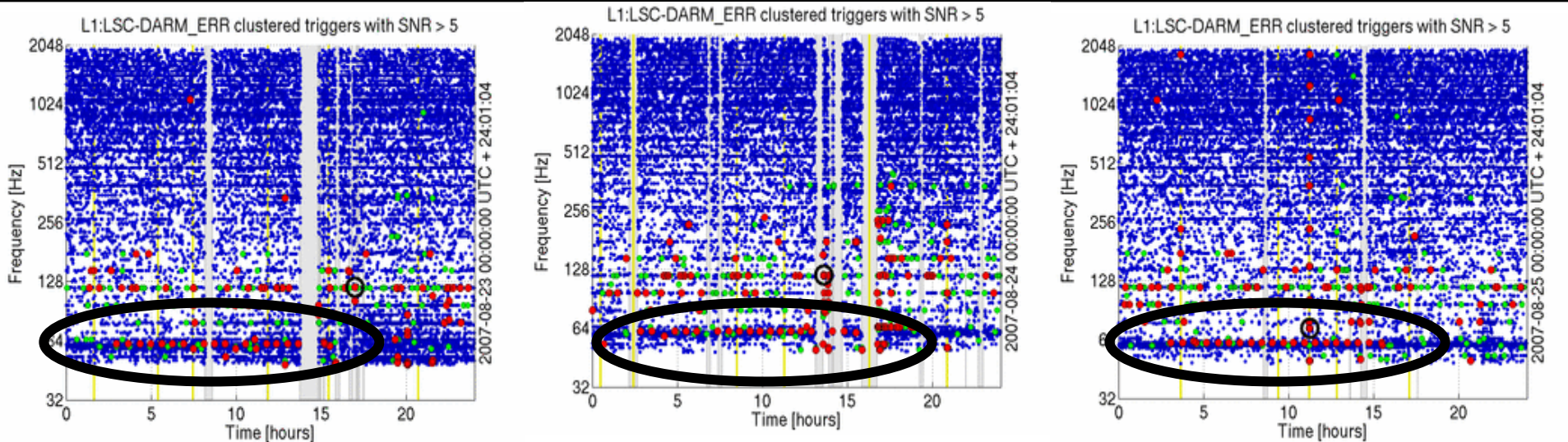


Coincident H1 and H2 glitch

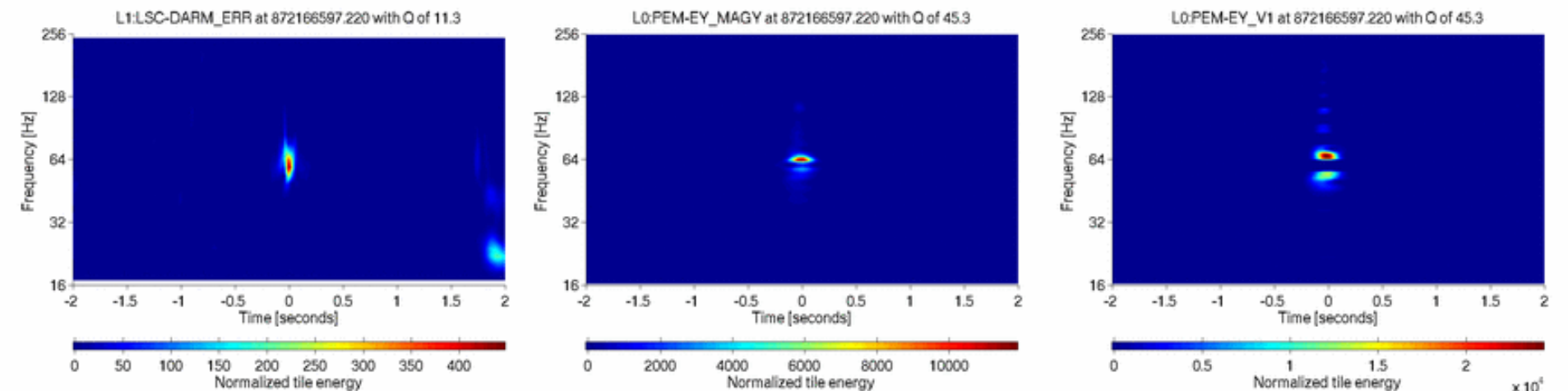


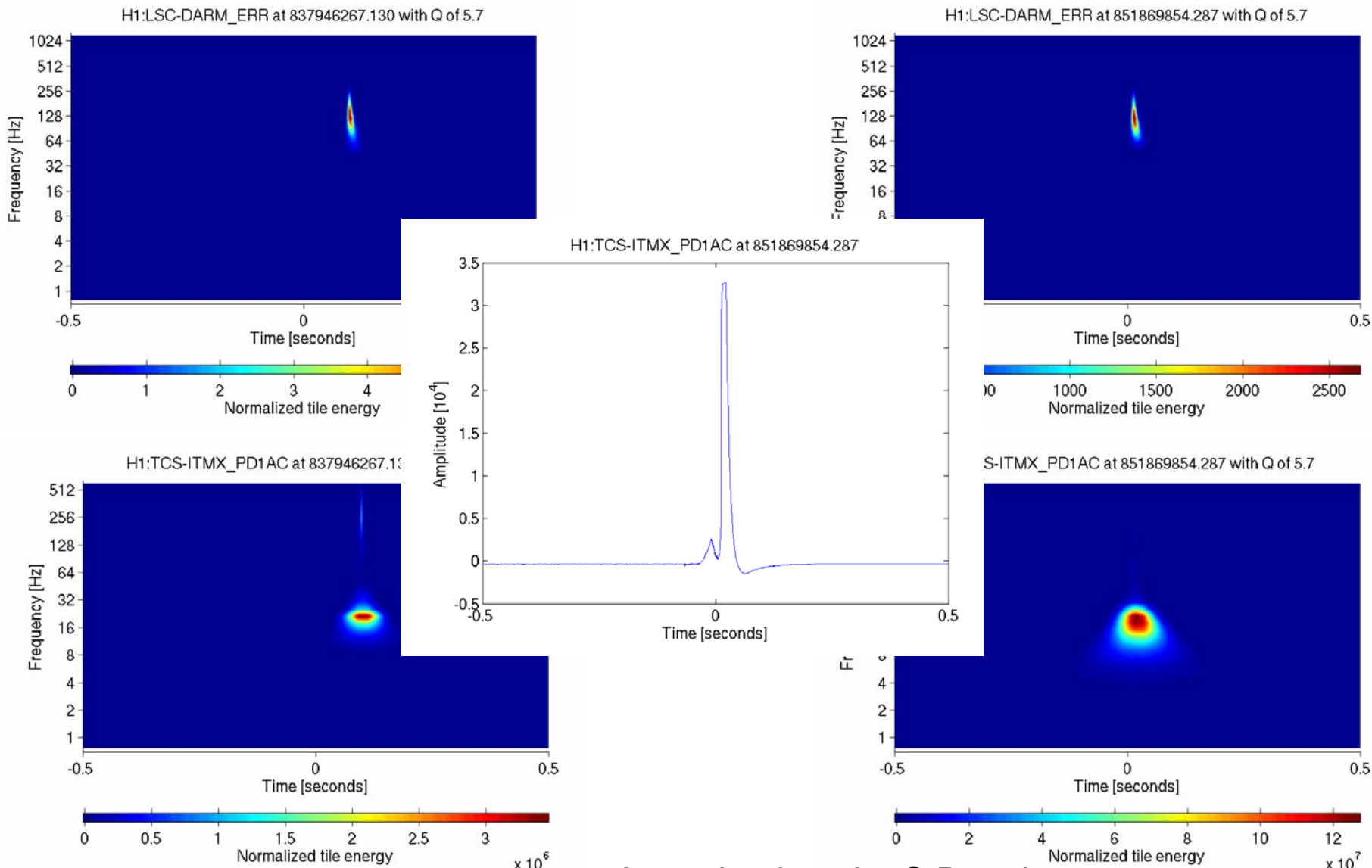
Jumps in power line amplitudes





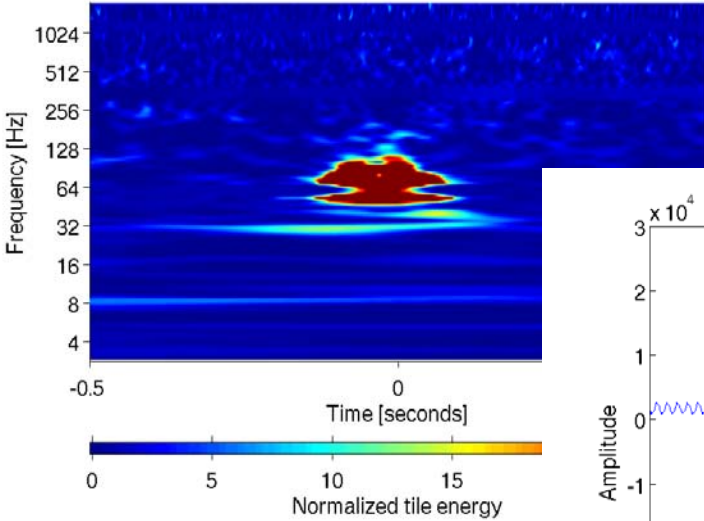
Quasi periodic SNR>20 glitches in gravitational channel associated with power line and magnetometer glitches at Y-end station



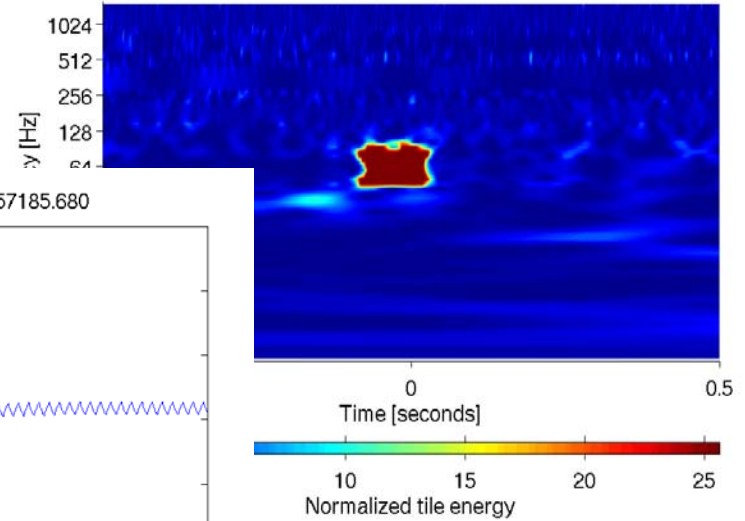


Investigations by S.Desai

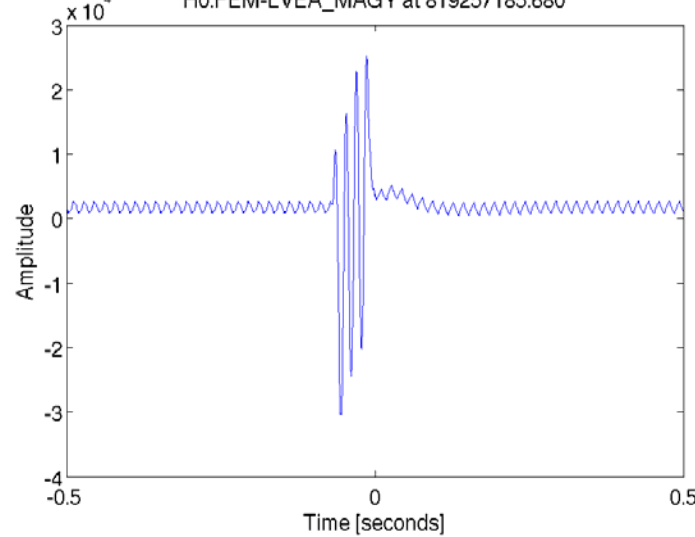
H1:LSC-DARM_ERR at 819257185.680 with Q of 22.6



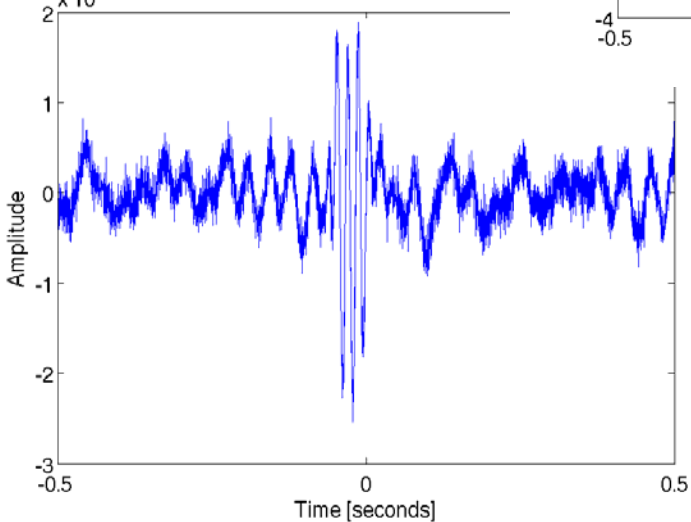
H2:LSC-DARM_ERR at 819257185.680 with Q of 11.3



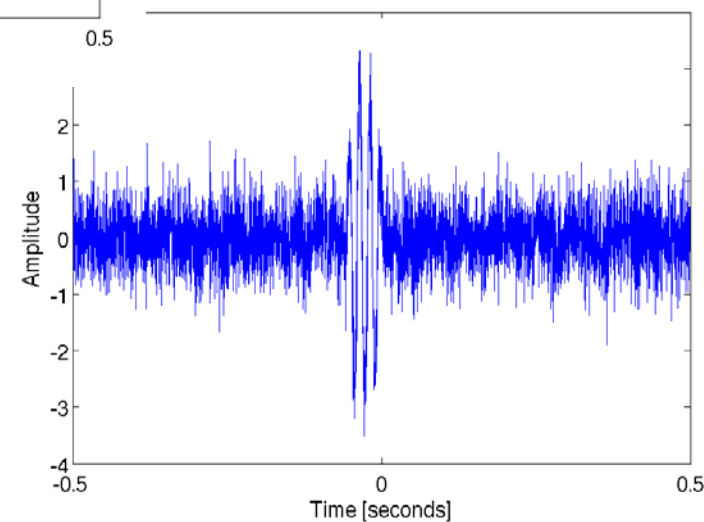
H0:PEM-LVEA_MAGY at 819257185.680



H1:LSC-DARM_ERR at 819257185



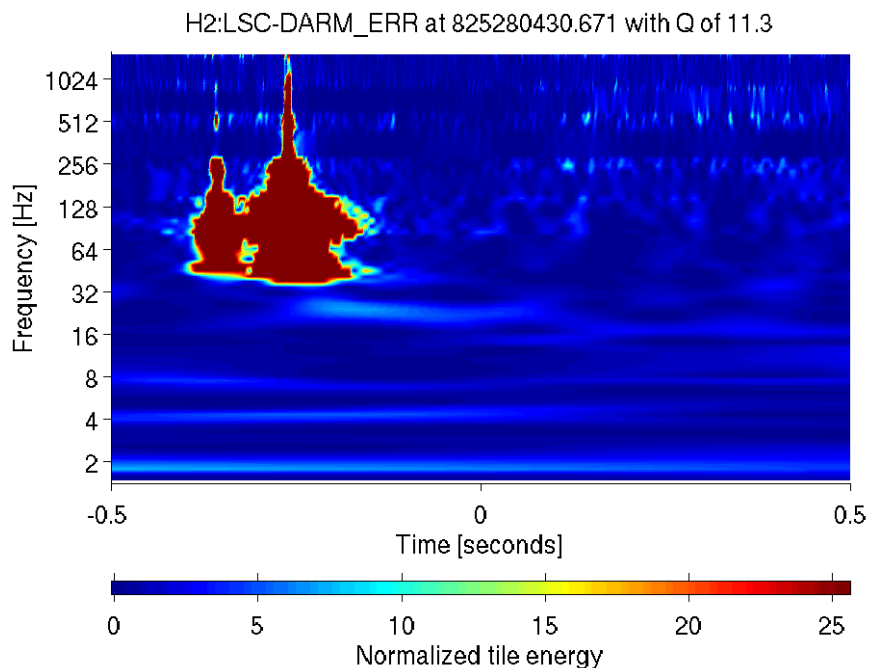
H2:LSC-DARM_ERR at 819257185.680



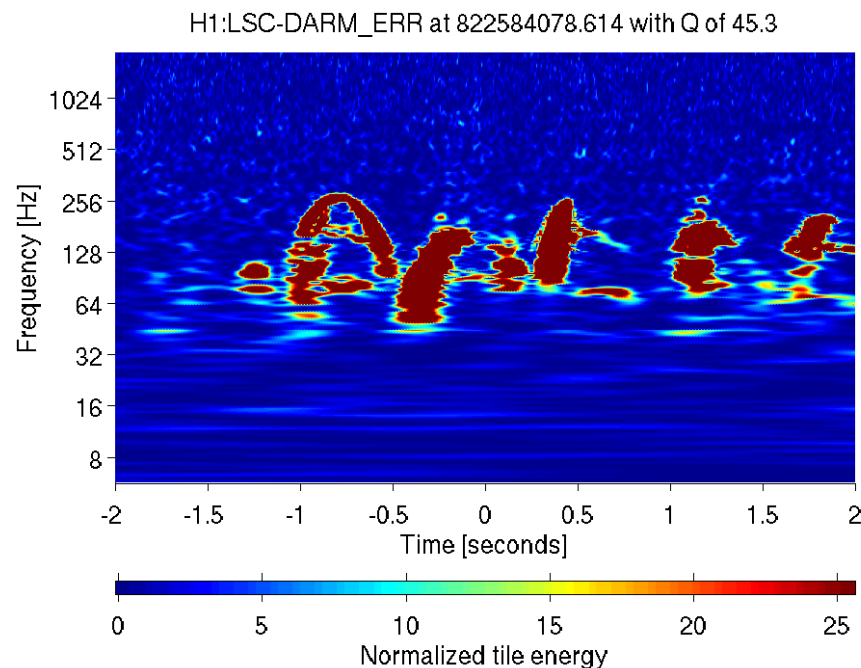
A big transient
seen in all
magnetometers
and volt-meters

Swinging optics from an unlocked detector produces glitches in locked detector

H2 when H1 is not locked



H1 when H2 is not locked



Data quality flags under investigation by Blackburn and Katsavounidis



Data quality

- Data quality flags are created when problems are identified
- Inserted into LSC segment and data quality database
 - Can query directly with LSCsegFind
 - Can retrieve with segwizard (one day latency)
 - Displayed in QScans (one day latency)
- Many data quality flags inserted automatically
- Should not be applied arbitrarily
- Need to test
 - Efficiency at vetoing glitches in gravitational-wave channel
 - Lost observation time
 - Risk of vetoing a true gravitational-wave signal
- Divide flags into categories depending on severity and use

Burst and Inspiral:

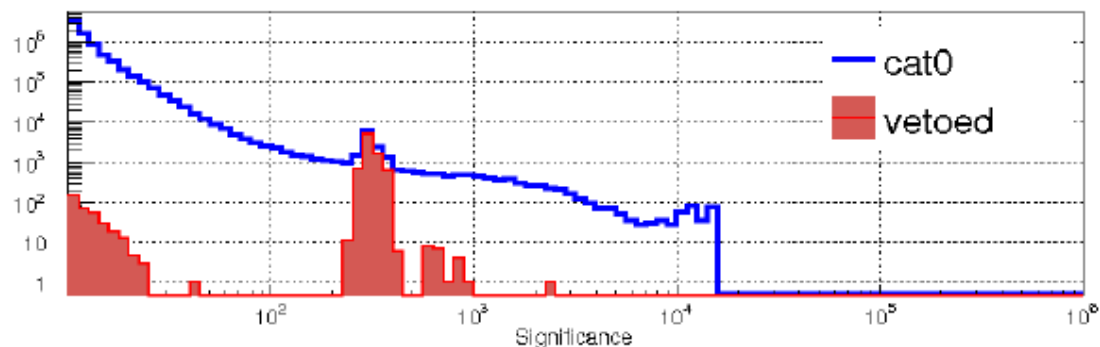
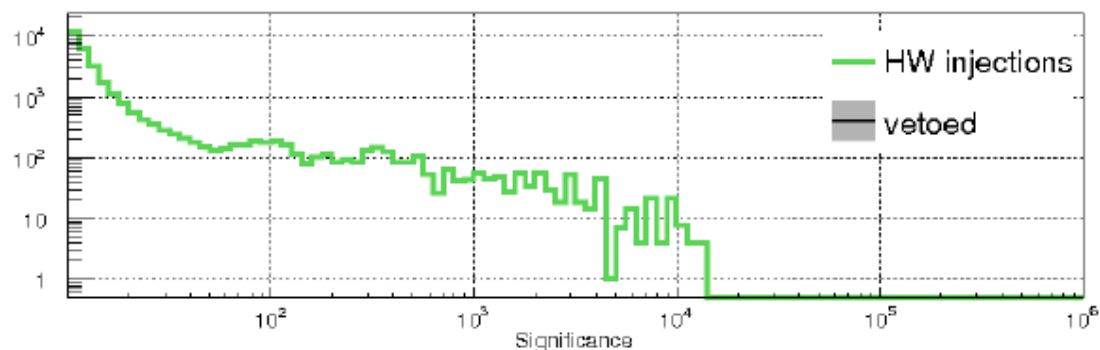
- OUT_OF_LOCK
- OUT_OF_SCIENCE_MODE
- PRE_LOCKLOSS_N_SEC
- MISSING_DATA
- INJECTIONS

CALIBRATION_DROPOUT_AWG_STUCK:V4

DeadTime:	8405/23437595 = 0.036%
Significance > 10	8718/ 7206555 = 0.121%
Significance > 50	8369/ 60842 = 13.755%
Significance > 100	8369/ 30536 = 27.407%
Significance >1000	1/ 3796 = 0.026%

Burst only:

- CALIBRATION_DROPOUT
- SEVERE_LSC_OVERFLOW



Burst and Inspiral:

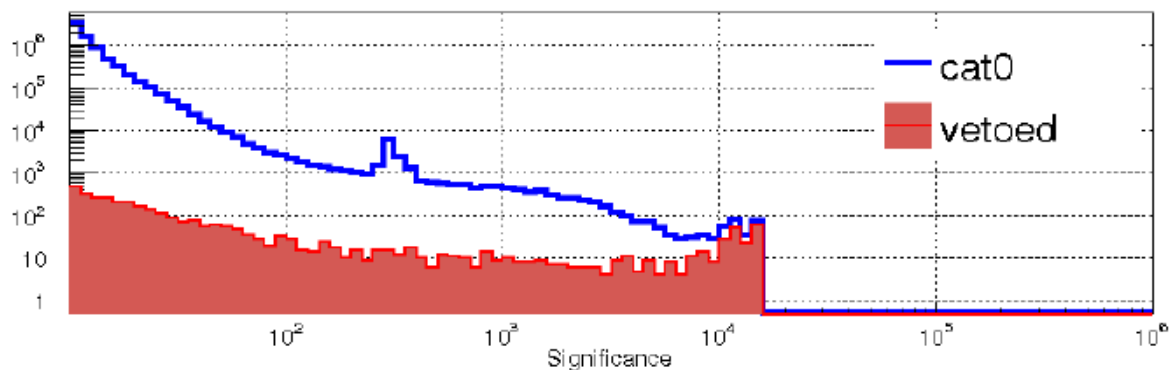
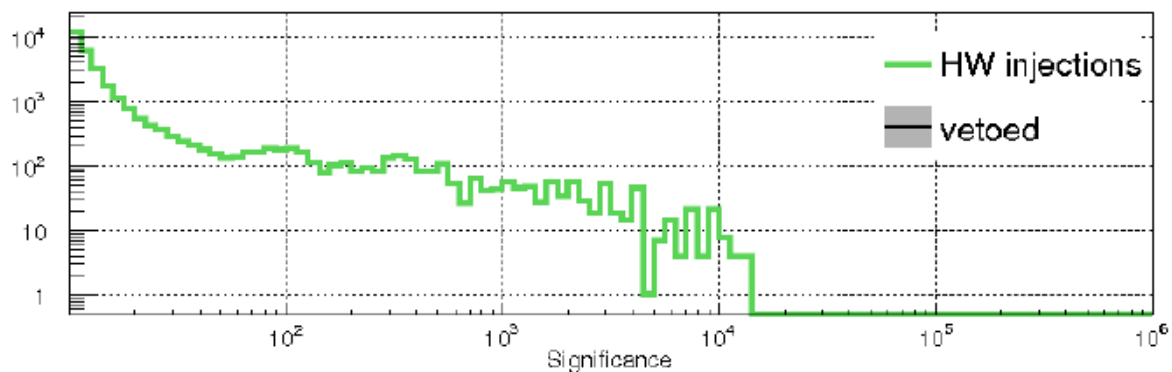
- OUT_OF_LOCK
- OUT_OF_SCIENCE_MODE
- PRE_LOCKLOSS_N_SEC
- MISSING_DATA
- INJECTIONS

Burst only:

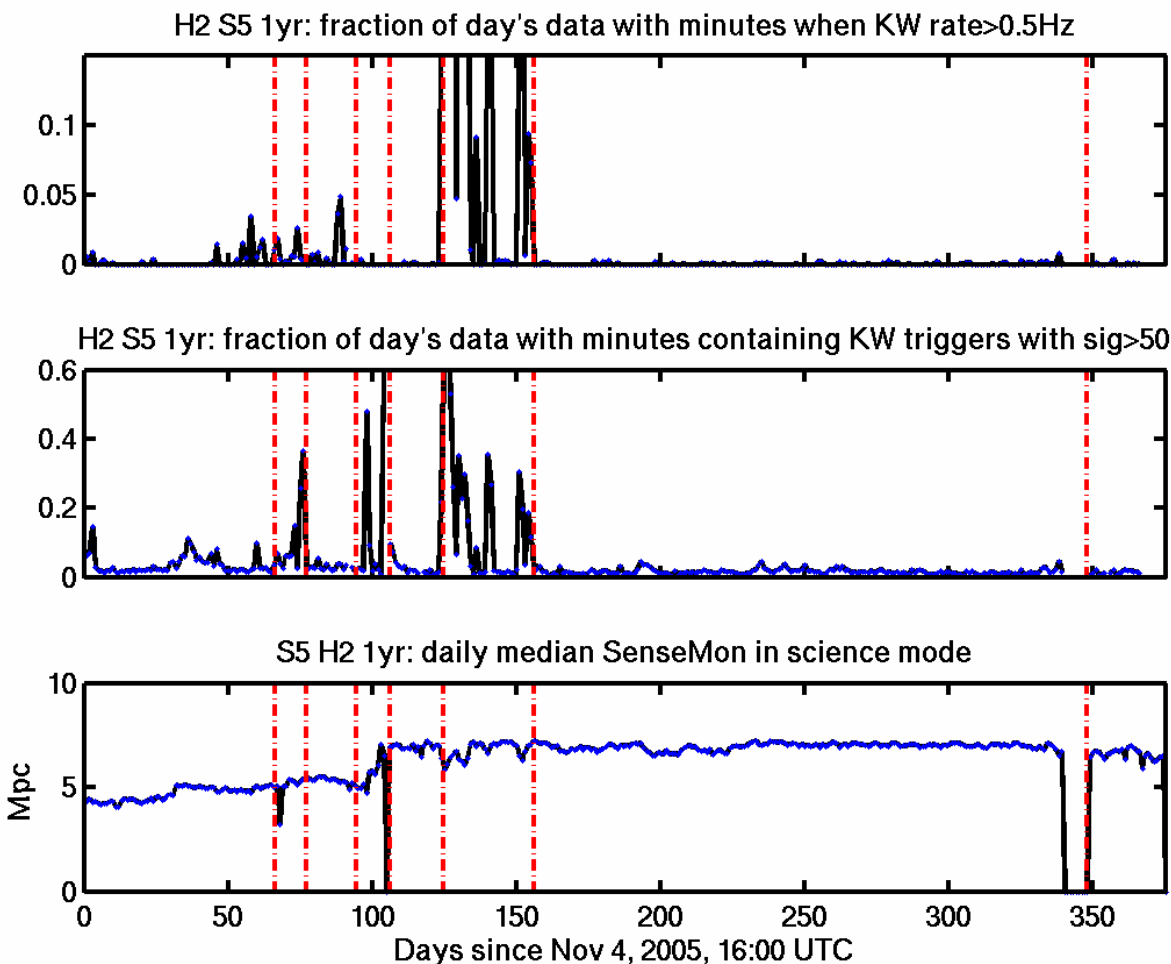
- CALIBRATION_DROPOUT
- SEVERE_LSC_OVERFLOW

SEVERE_LSC_OVERFLOW:V2

DeadTime:	2315/23437595 = 0.010%
Significance > 10	3316/ 7206555 = 0.046%
Significance > 50	805/ 60842 = 1.323%
Significance > 100	587/ 30536 = 1.922%
Significance >1000	318/ 3796 = 8.377%

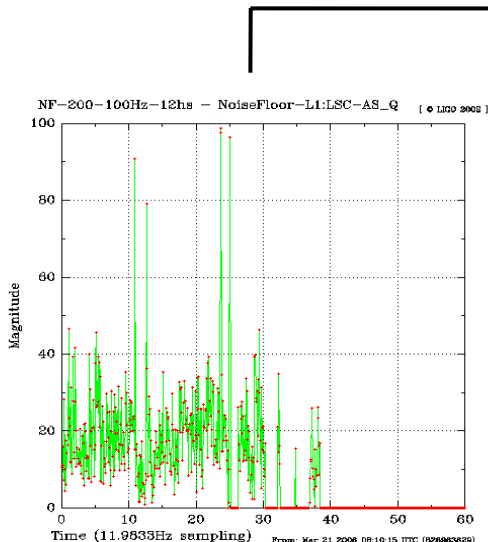


- Identify periods where detector behavior was different enough to require a separate study of data quality flags and vetos



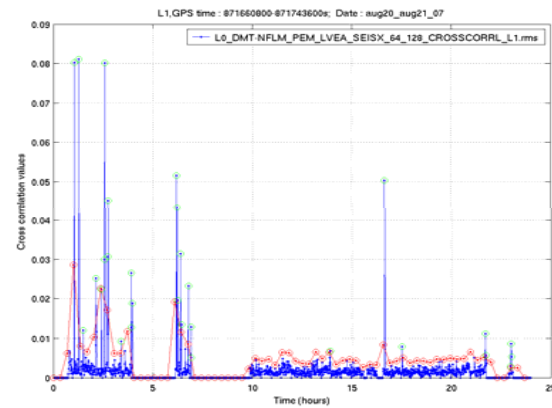


Other activities



Online

Monitor checks PEM couplings with AS_Q at each site. Offline analysis consists of implementing running median in the time domain, setting a threshold, and identifying threshold crossings.



Offline

Offline results available at http://www.phys.utb.edu/~soma/MNFTresults/NoiseFloorMon_daily.html

More detailed analysis is conducted around events of interest. A seismic DQ flag is in the works.

Threshold Crossings Near Candidate Event

06232807 43:05:44.687 UTC

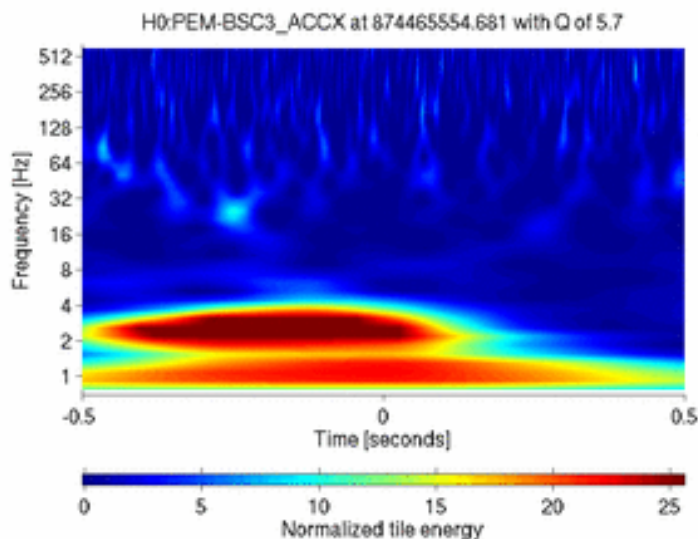
Channel	Frequency Bandwidth	NoiseFloorMon Offline Analyis	Nearest Threshold Crossing Time to Event	Corresponding Cross-Correlation Value with AS_Q	Time Series	Time Frequency
SEIS_V	0-15		07:44:3240	0.0495551154		

- Work by Syracuse group (Saulson, Smith, Hartnett, Evans)
- Goal
 - To hear the different character of glitches
 - Hope the classification will lead to clues to the origin and solution of glitches from different sources
- You can hear a lot of different things going on
 - seismic noise and upconversion
 - violin modes
 - mirror modes
 - Locking and unlocking transients
 - cross-talk from swinging mirrors when H1 or H2 unlocked
- Following up interesting events from burst search

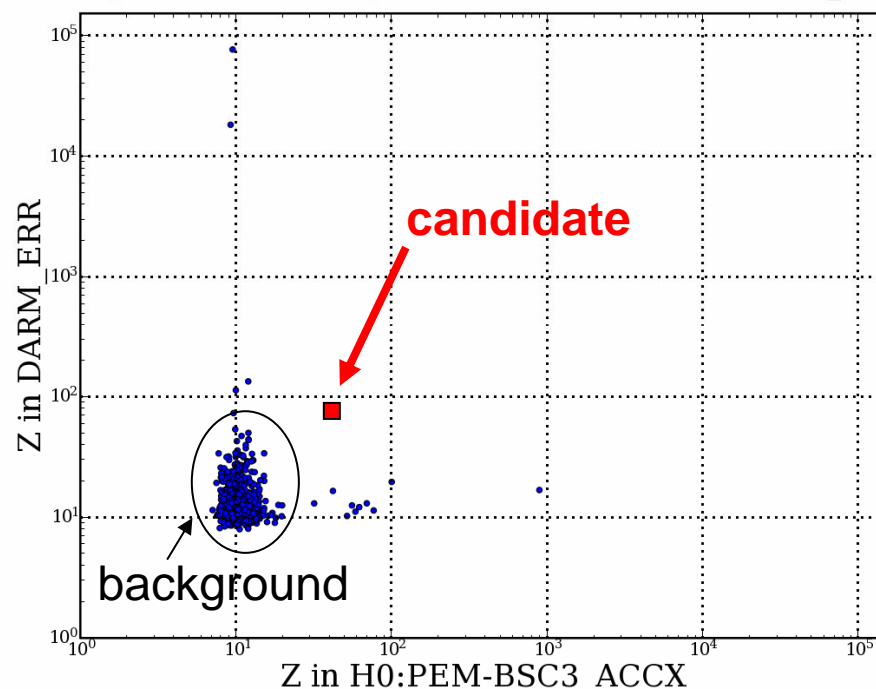
- How relevant is a glitch observed in an auxiliary channel?
- Estimate background by running QScans at random times

Example: qscan at 874465554 (burst candidate)

Accelerometer glitch (Z = 41.9)



Background versus foreground for channel: H0:PEM-BSC3_ACCX



significant glitch ? \Rightarrow needs more investigation...



Present and future

- Focus has now shifted from feedback to operations and commissioning to support for data analysis
 - Follow-up of candidate events (Gouaty, Blackburn)
 - Develop new data quality flags (Zweizig)
 - Identification of detector epochs (Gonzalez, Cadonati)
 - Study effectiveness of data quality flags (Cadonati, Slutsky)
 - Study effectiveness of vetoes (Katsavounidis)
 - Catalog and classification of glitches (Desai, Mukherjee)
 - Post S5 glitch studies (Schofield, Slutsky)
- Initial focus on first year of S5 identified by analysis groups
- Need to collect and summarize results from all of S5
- Need to analyze detector logs to develop single issues data quality flags

- Astrowatch
 - Provide feedback to commissioning teams on data quality
 - Provide data quality support on request for interesting events during the astrowatch period (GRBs, SGRs, etc.)
 - Develop infrastructure necessary to meet S6 goals
- S6
 - Automated production of many data quality flags
 - Rapid response to support real time data analysis
 - Develop organized way for operators to
 - Recommendations based on S5 experience:
 - Database to track changes to the detectors including changes to auxiliary and environmental channels
 - Method for operators and scimons to identify data quality issues in a format that is easily used by data analysis groups.



End