New Glitches seen/studied in Block-Normal

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for

Glitch Working Group and many others

Detchar session

March 2007 LSC meeting

1

Outline of Talk

- Block-Normal "glitches" indicates events in S5 with (*DARM-ERR*) Power threshold > 1000

- This talk will provide a summary of all "new" Block-Normal glitches which have been studied in detail since last LSC meeting .

- I won't talk about all new glitches seen :
  - ➤ L1 autoburt
  - ➤ L1 glitches with AS trigger *(Gaby/D. Hoak)*,
  - ➤ ETMY_COIL saturations *(Laura)*
  - ➤ ASPD triggered (LSC-AS_TRIGL flag set) *(John Z.)*

  and many any others which I forgot about
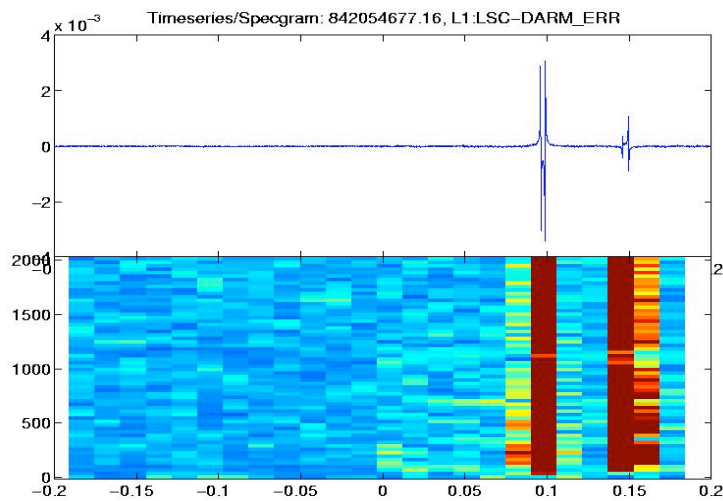
Dropout in pulsar injections

D. Hoak, V. Mandic
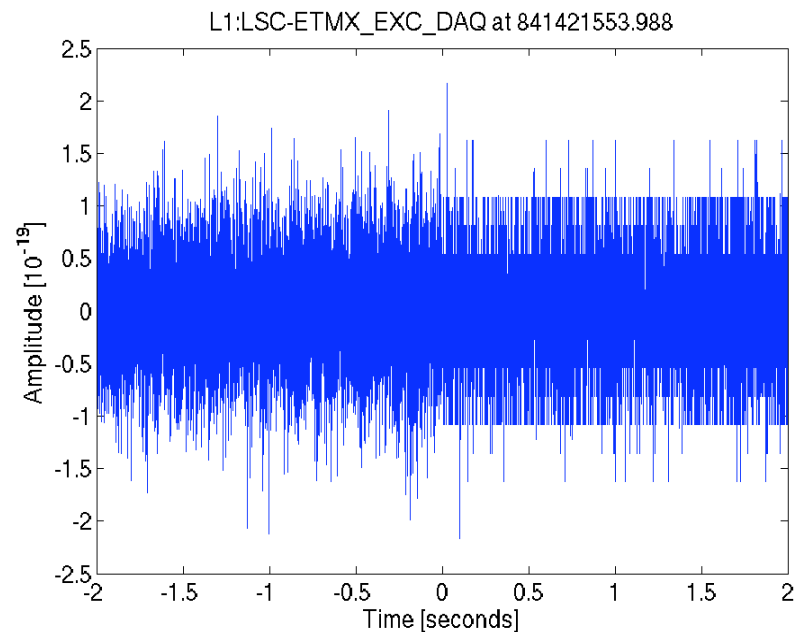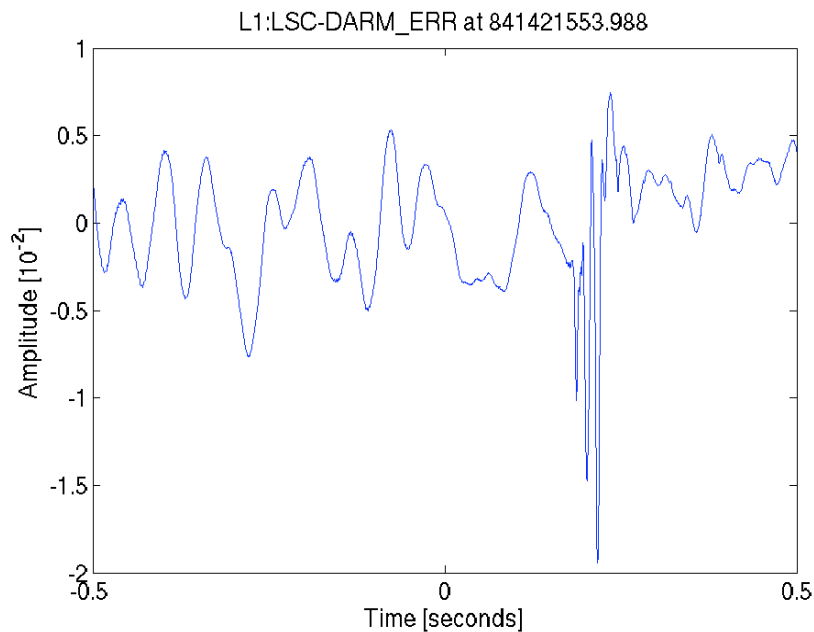
- This was caused by a crash in the injection stream due to problems in communication with awg + some time for injection buffer to empty *(Mandic)*
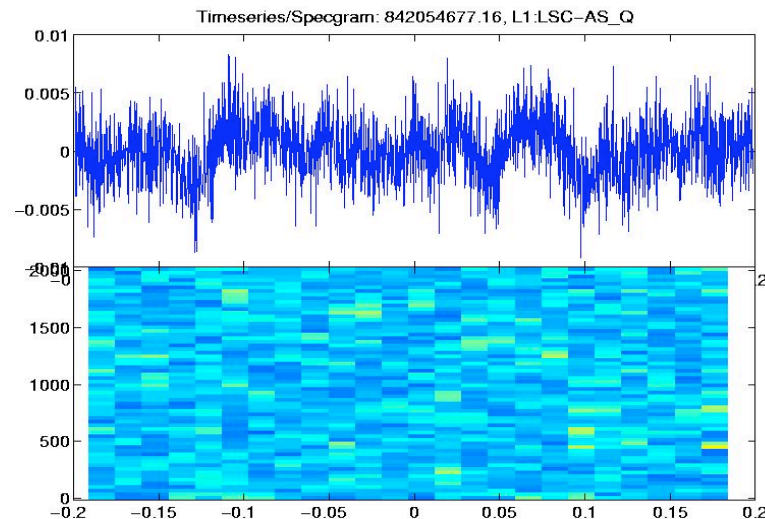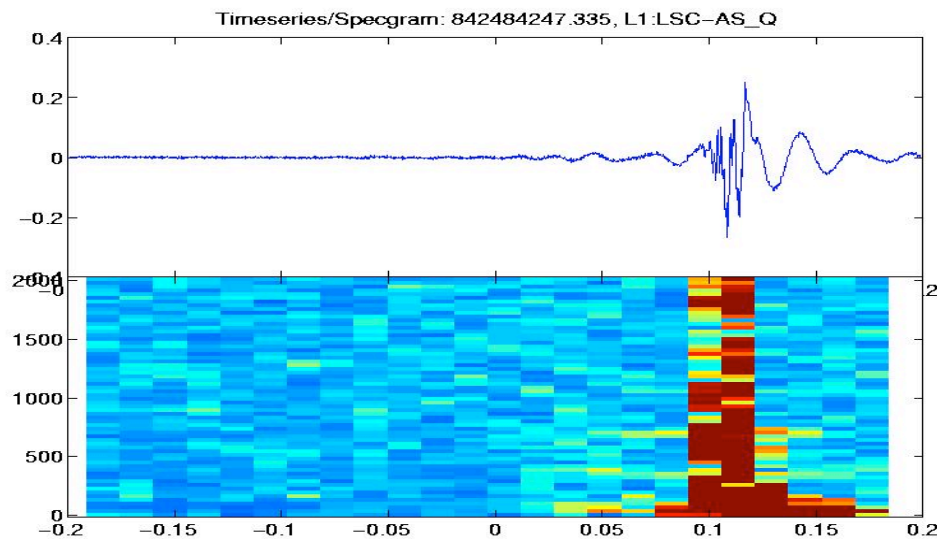
DAQ Readout Glitches

J. Zweizig, B. Johnson

- Notice the glitch in DARM-ERR but nothing in AS-Q

- Cause of these glitches due to DAQ readout errors

$$dataValid = 4096 \longrightarrow INVALID\_DARM\_ERR$$

$\longrightarrow$ DQ flag available (John)

LLO Travelling wave glitch

N. Zotov, M. Fyffe *(during shift)*

Timeseries/Specgram: 842484247.335, L1:LSC–AS_Q

This plot made 17–Sep–2006 22:34:21

No smoking-gun
from Q-scan or event
Display *(seen in ETMX
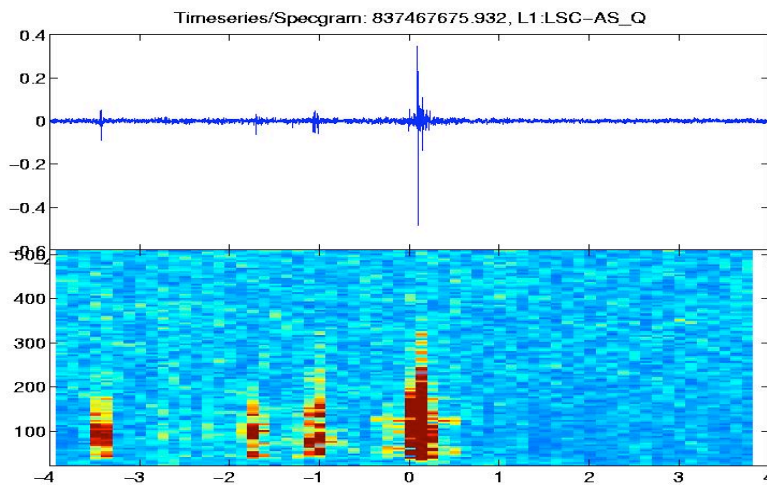and ETMY pitch and yaw)*

Diagnosed using J.Giamie's
HEPI templates.

- Caused by a microseismic wave traveling in X-direction hitting DARM-ERR (before HEPI could take control)

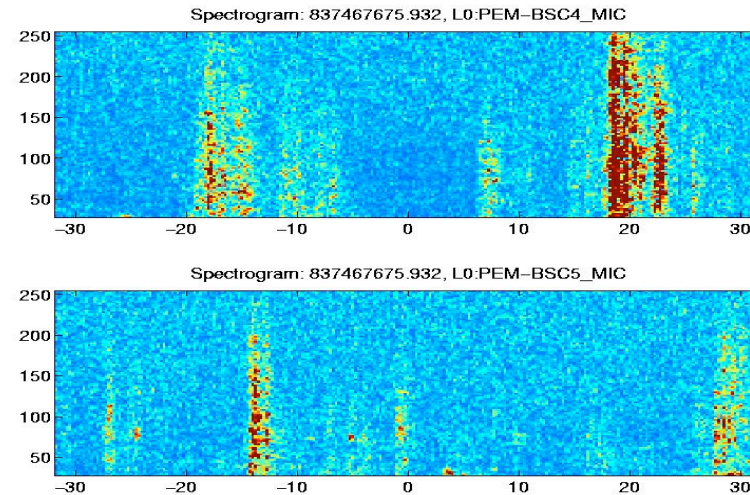- No followup has been done to find similar glitches as far as I know

LLO BSC4/5_MIC glitches
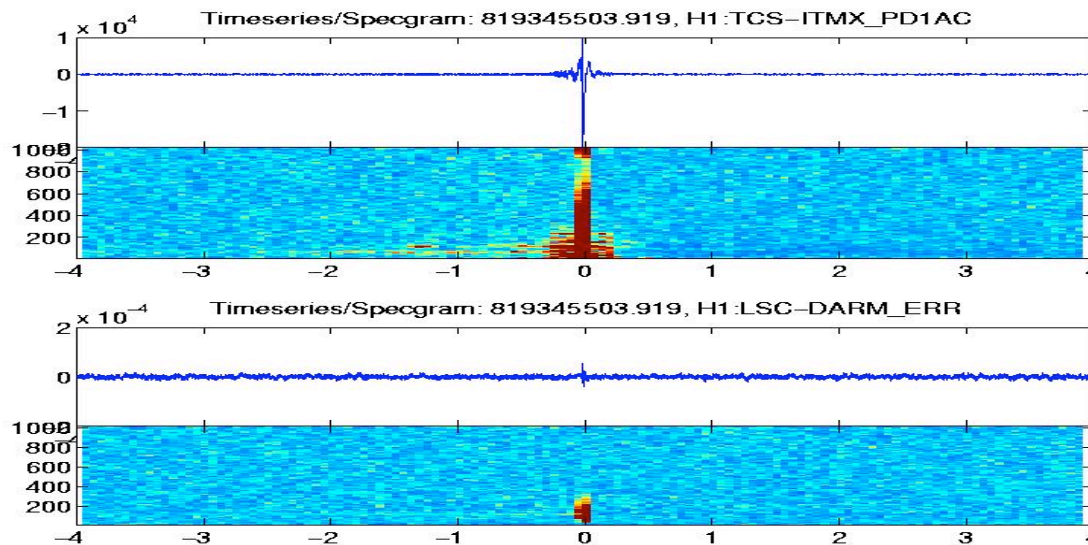

- In July, found a 20 minute period with broadband noise in BSC4/5 MIC channels (distinct from airplane signature) and many DARM-ERR outliers in this period.

- Follow-up on such glitches *(using Kleine-Welle)* in progress.

LHO TCS glitches

• TCS channels glitch a LOT . Low amplitude TCS glitches innocuous. (Patrick S) However, large amplitude TCS glitches affect DARM-ERR

H1:TCSX

K-W significance > 2000

H2:TCSY

K-W significance > 3000

TCS DQ flag available
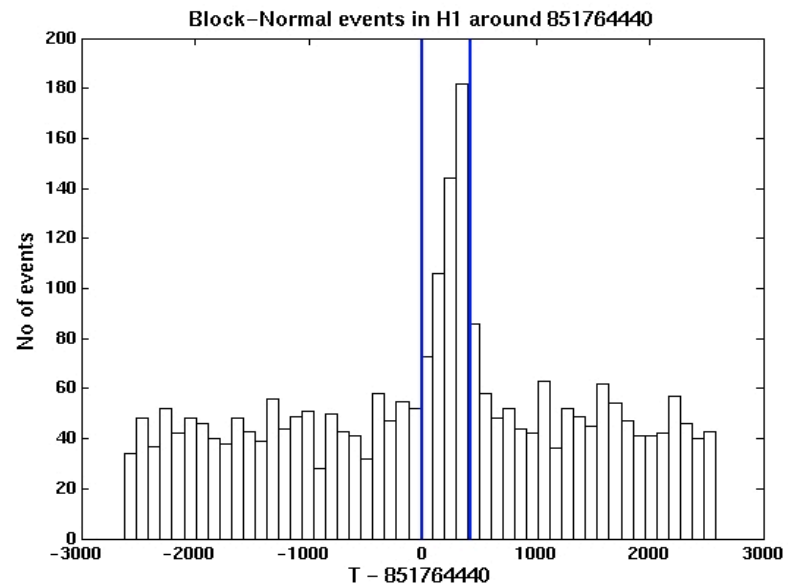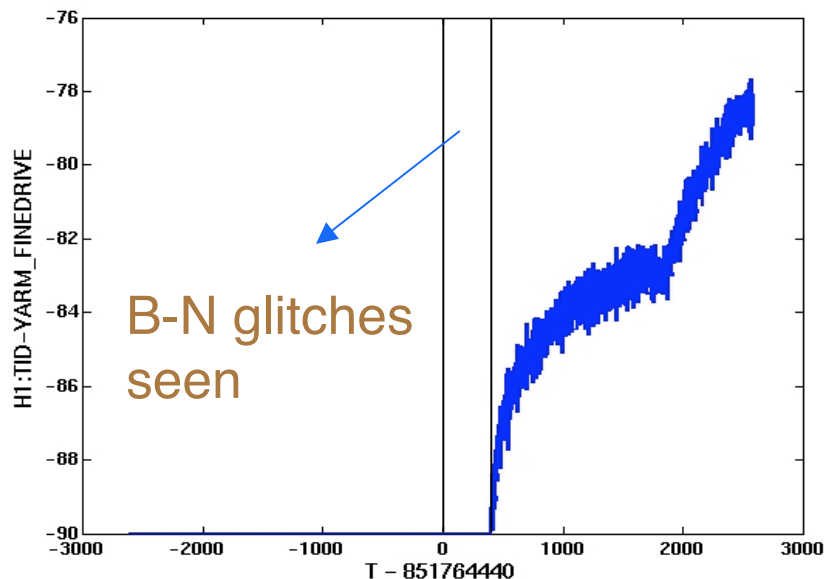
• Lot of work also done by commissioners to reduce/understand TCS glitches *(Cheryl, Sam W., Phil W., Robert S. etc)*
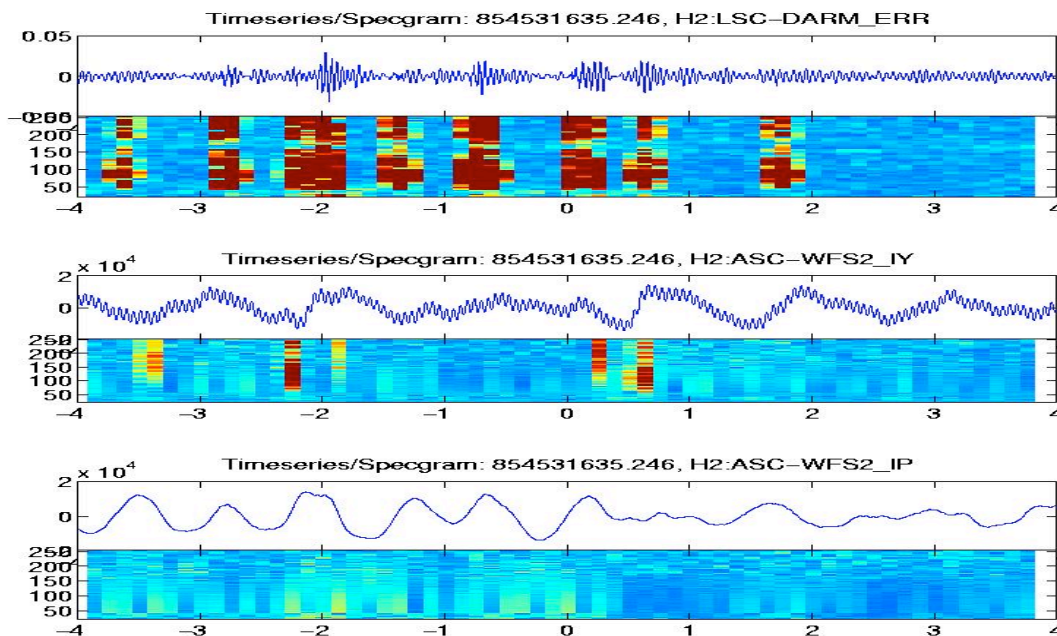
Tidal Glitches

Malik, Ski (during shift)

- Many Block-Normal outlier events seen when tidal servo comes out of saturation.
- Such events seen in earlier science runs. More study needed to determine whether we need a DQ flag for such events

H2 ASC overflow glitches (unknown)

- Since December, H2 has shown many glitches which occur in spurts every few secs). ~~Last seen on Feb 3rd.~~ Most of these have ASC-OVERFLOW flag associated with them

Timeseries/Specgram: 854531635.246, H2:LSC-DARM_ERR

Timeseries/Specgram: 854531635.246, H2:ASC-WFS2_IY

Timeseries/Specgram: 854531635.246, H2:ASC-WFS2_IP

This plot made 06-Feb-2007 21:53:34

Show strong glitches in WFS2 (Yaw) and almost nothing in WFS2 (Pitch)

These have returned last week
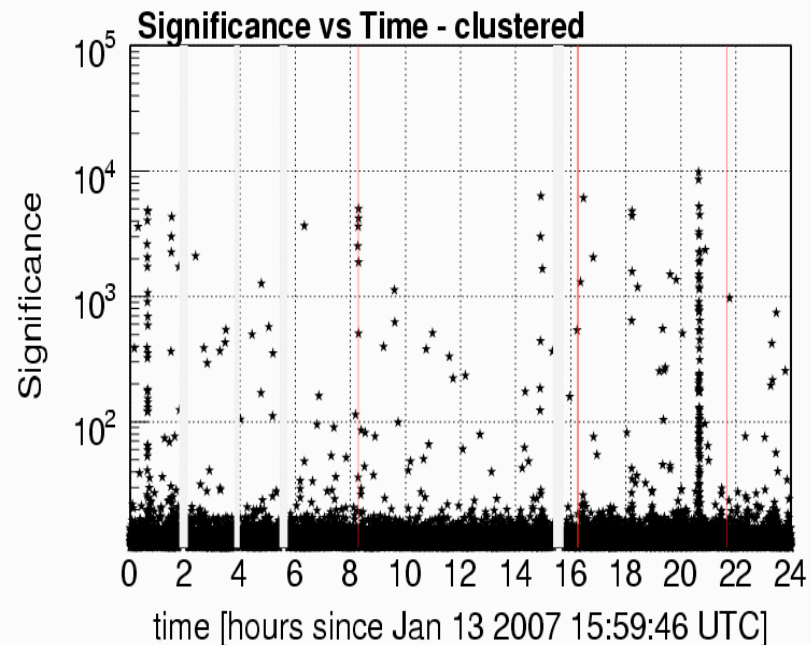
H2 ASC overflow glitches (contd)

- Some evidence for periodicity of glitches(50 minutes in December and 35-40 minute in Jan).
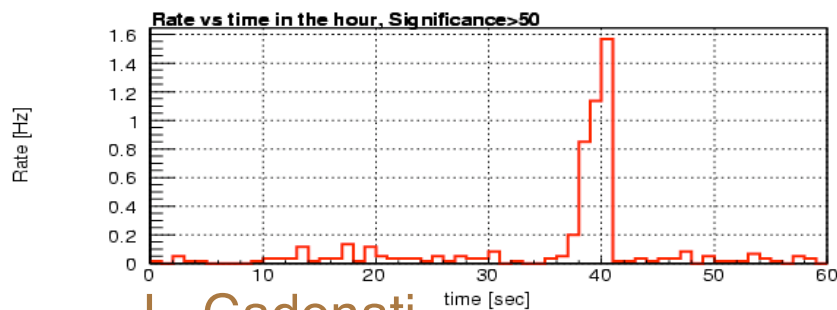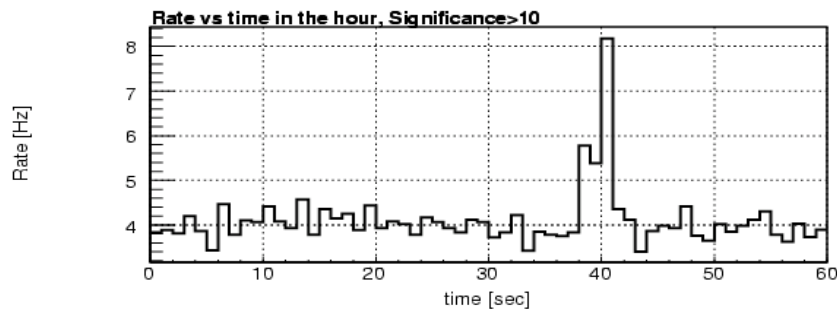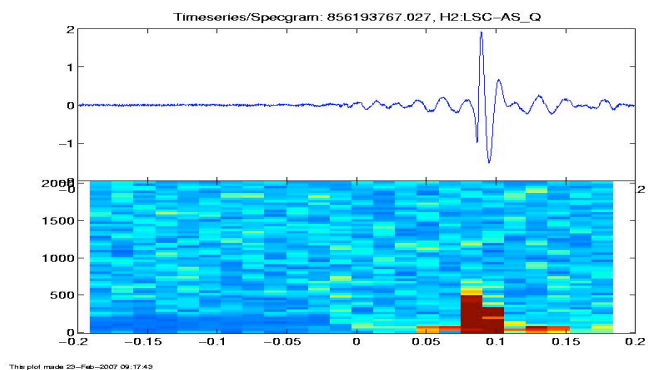

L. Cadonati

No clue as to the cause of these glitches (inspite of many Investigations). Same cause responsible for all of these.

(Unknown) Unknowns

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

Timeseries/Specgram: 856193767.027, H2:LSC-AS_Q

Example of Lonely glitch

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

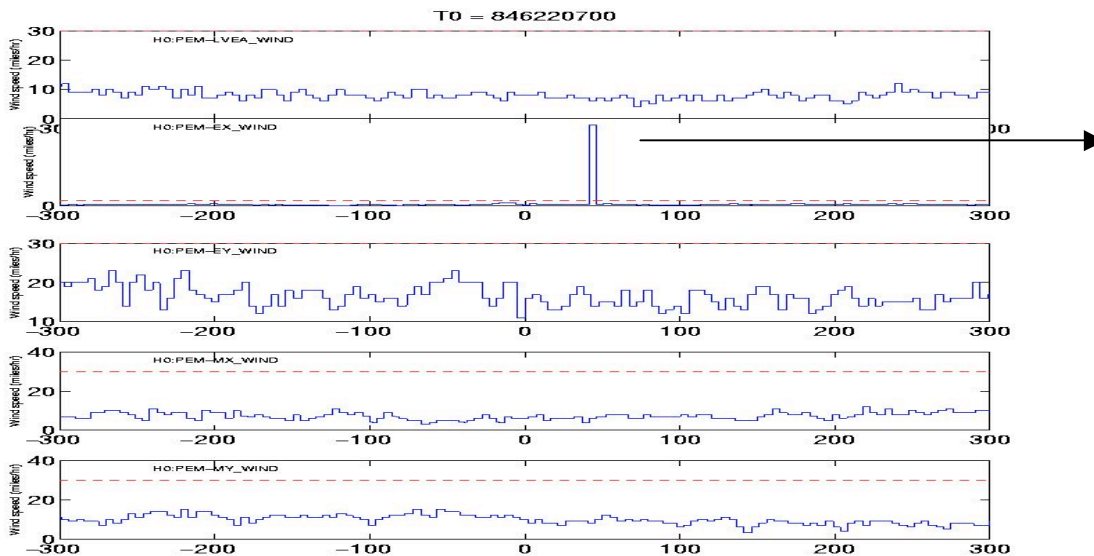Maybe some glitches don't show up in Q-scans/spectrograms of any other diagnostic channels?

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

11

New Auxiliary channel glitches

- Out of sequence segment numbers *(L. Goggin)*

- Example of a glitch in PEM-EX_WIND

500 miles/hr !!!!

Probably caused by a weather station malfunction.

- Incorrect flagging of "WIND_OVER30MPH" flag for this case.

Conclusions

- Since last LSC meeting , few more glitches have been identified and studied in detail and DQ flagged.

- However we still don't have any idea of the cause of almost 40 % of our glitches.