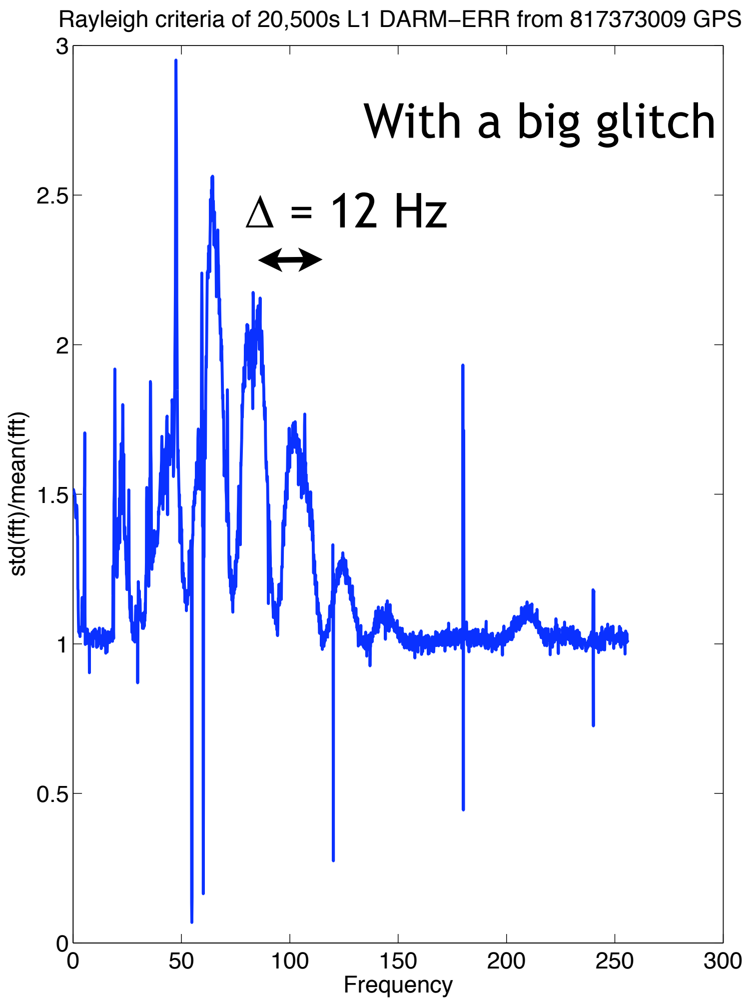
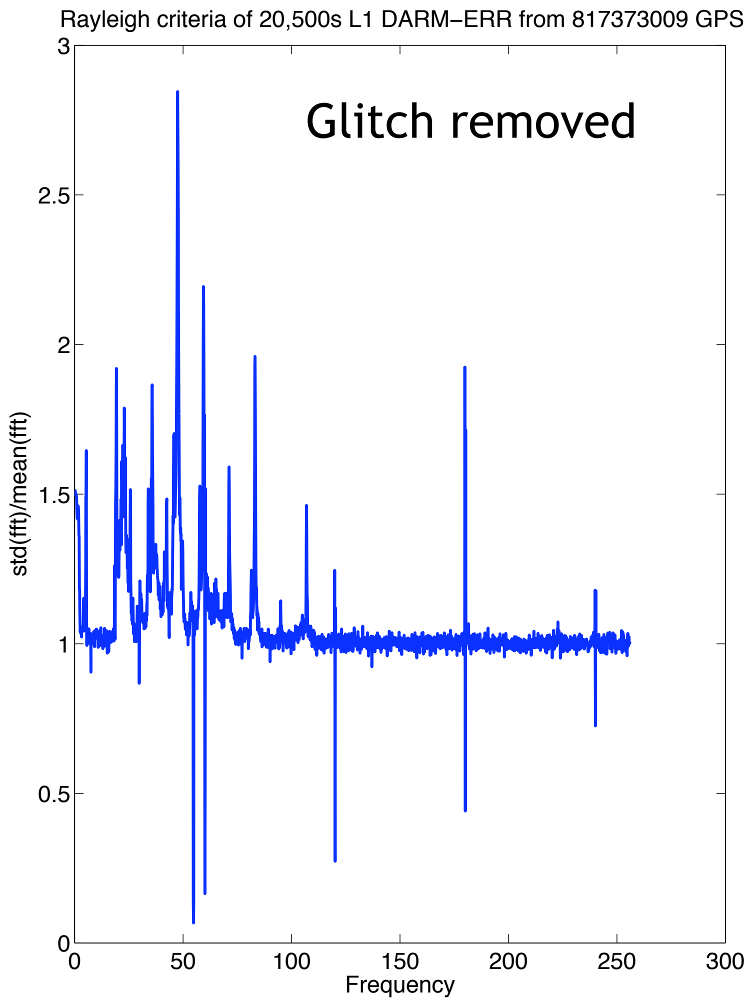
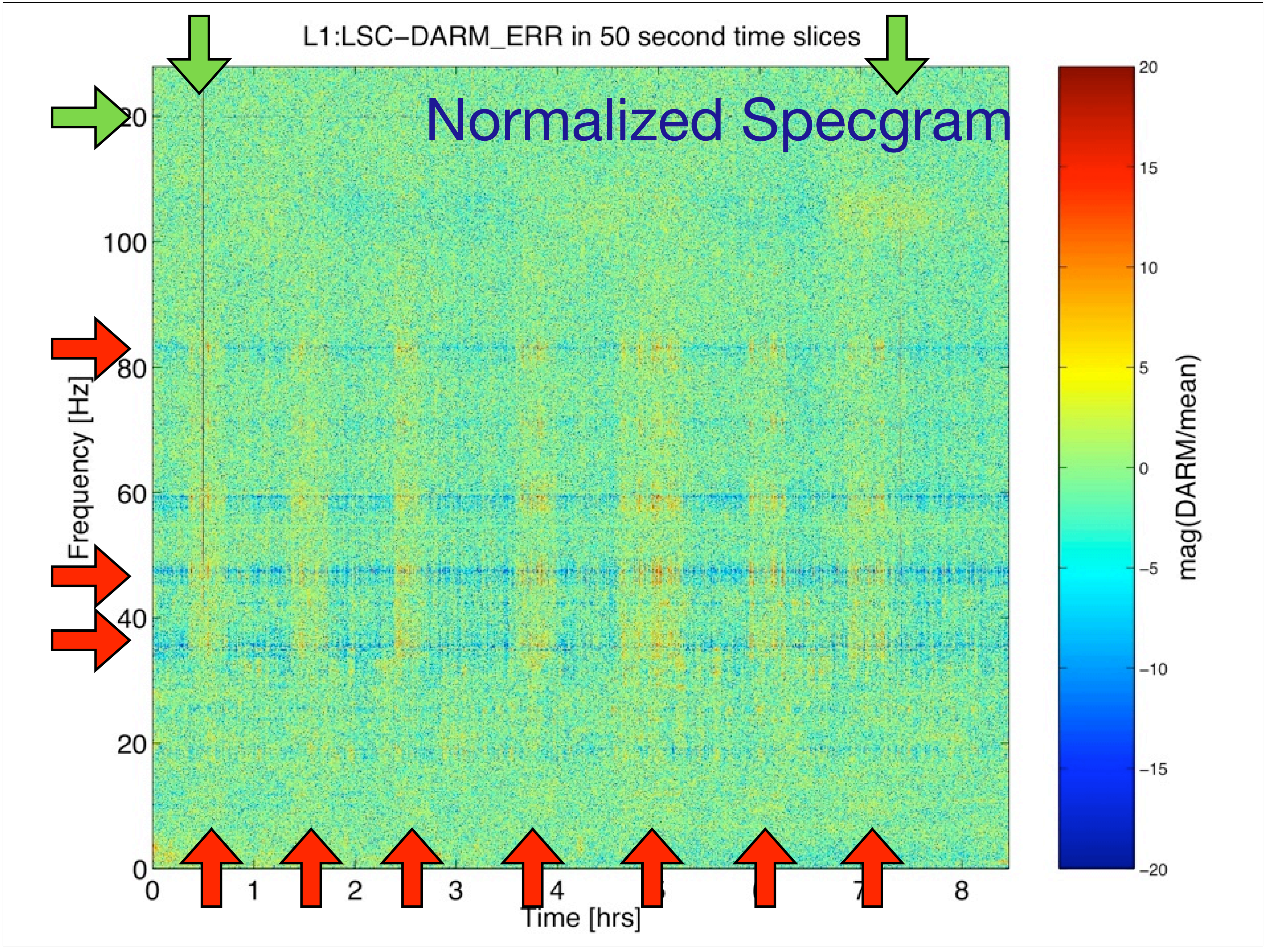
Gaby suggested I look a the Rayleigh distribution of DARM_ERR for 10,000+ s lock segments.

Divide time series into many 10s segments, the statistics of each 1/10 Hz bin follows have sigma/mu = constant

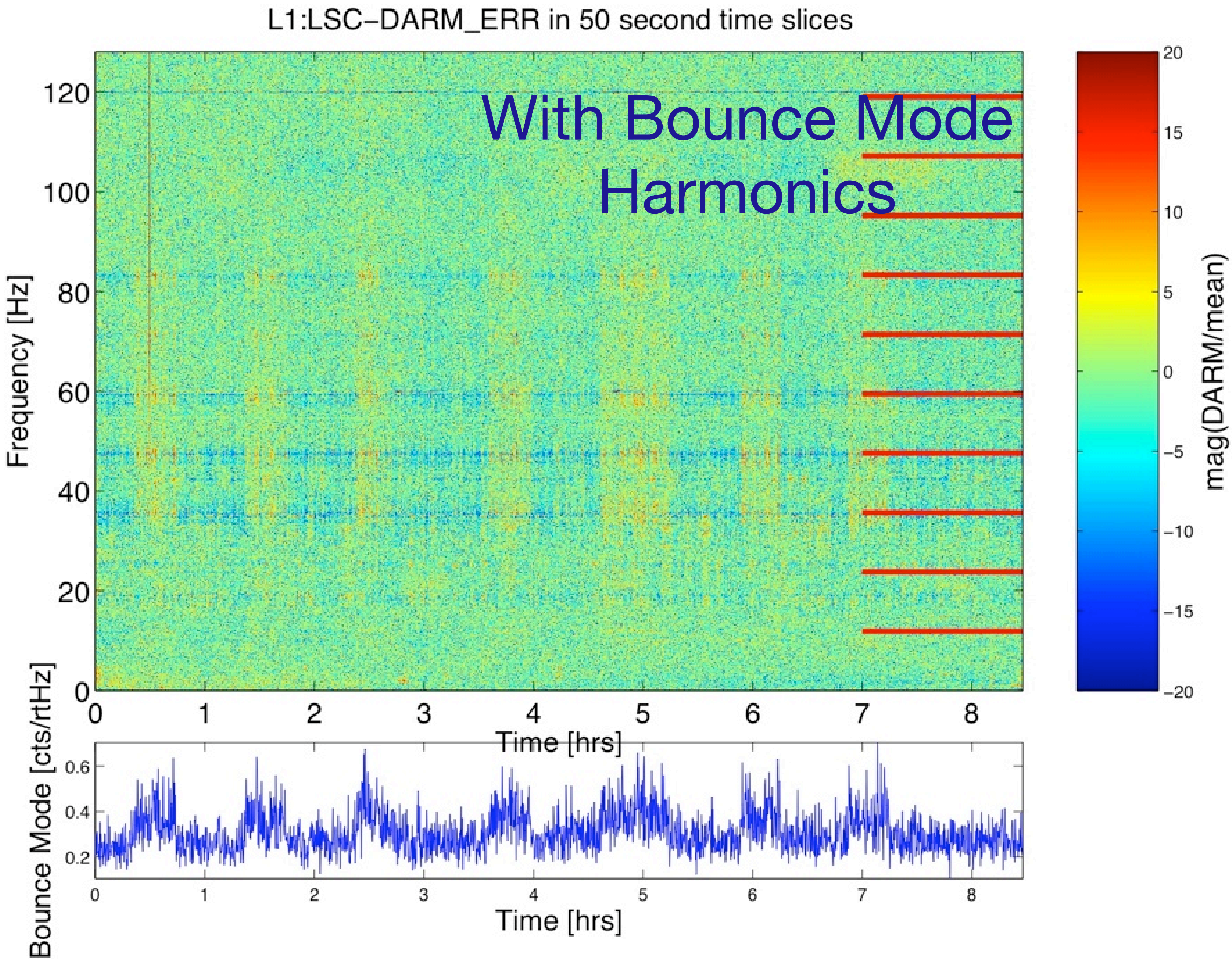
Rayleigh distribution







L1:LSC-DARM_ERR in 50 second time slices
Normalized Specgram
Frequency [Hz]
Time [hrs]
mag(DARM/mean)
0
20
40
60
80
100
20
15
10
5
0
−5
−10
−15
−20
0
1
2
3
4
8

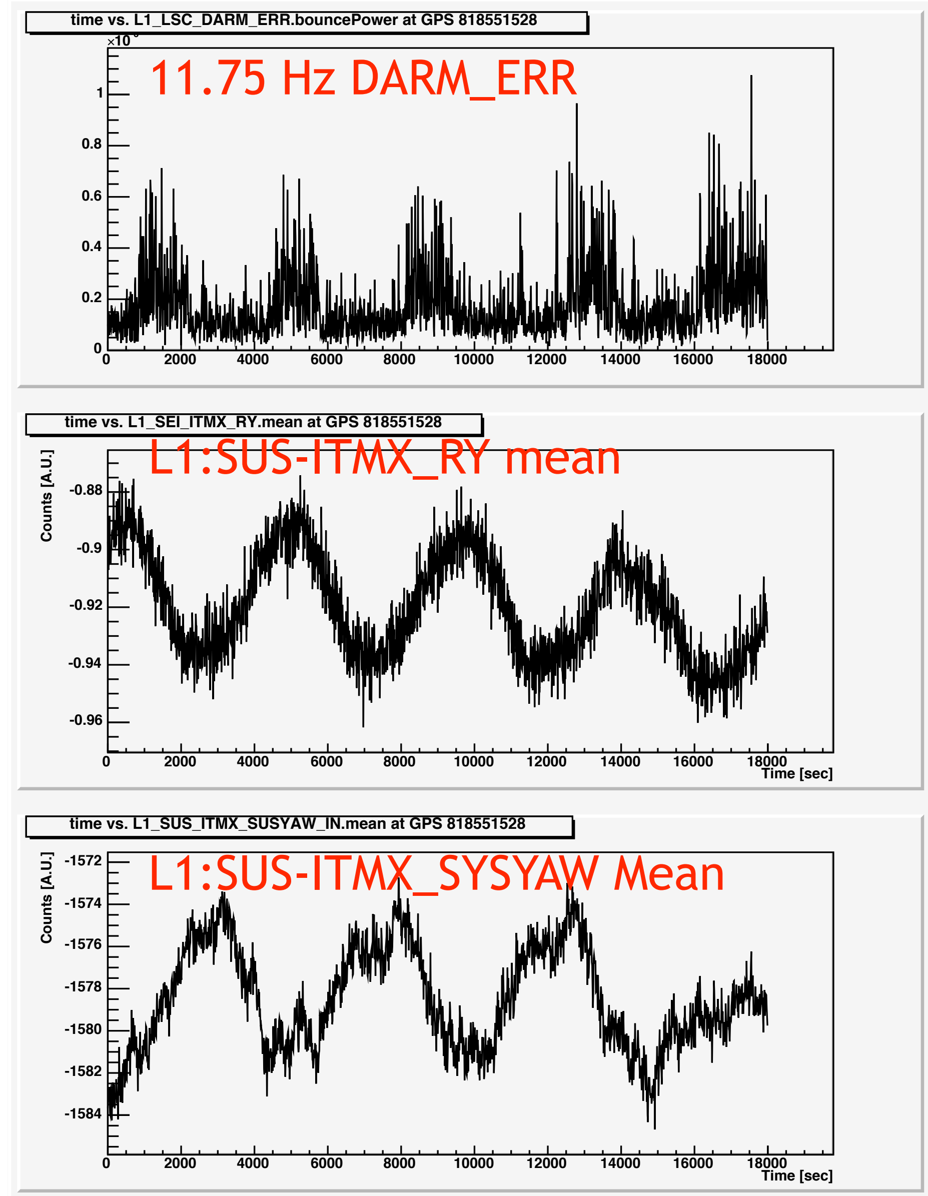


L1:LSC-DARM_ERR in 50 second time slices
With Bounce Mode Harmonics
Frequency [Hz]
Time [hrs]
mag(DARM/mean)
Bounce Mode [cts/rtHz]
Time [hrs]

DMT, Root, and JohnZ

- Find long duration segments
- Read in all L1 (then L0) channels in 10s strides and calculate mean, Std.Dev., N x Bounce power
- Measure the coherence with DARM_ERR bounce mode: (x,y) = sum_i x[i] * y[i], coh(x,y) = (x,y)/sqrt((x,x)*(y*y))
- Follow up the highest coherences
- Bounce modes show up much better in MICH_CTRL than in DARM_ERR

Pringle Mode Period



WRONG!

L0 Frames - lots more channels

Need to go to Raw frames - 3,000+ channels: HAM3 accelerometers not in L1, HEPI sensors only in L0 frame, etc.

Calculate coherences as before

RM strongest coupling

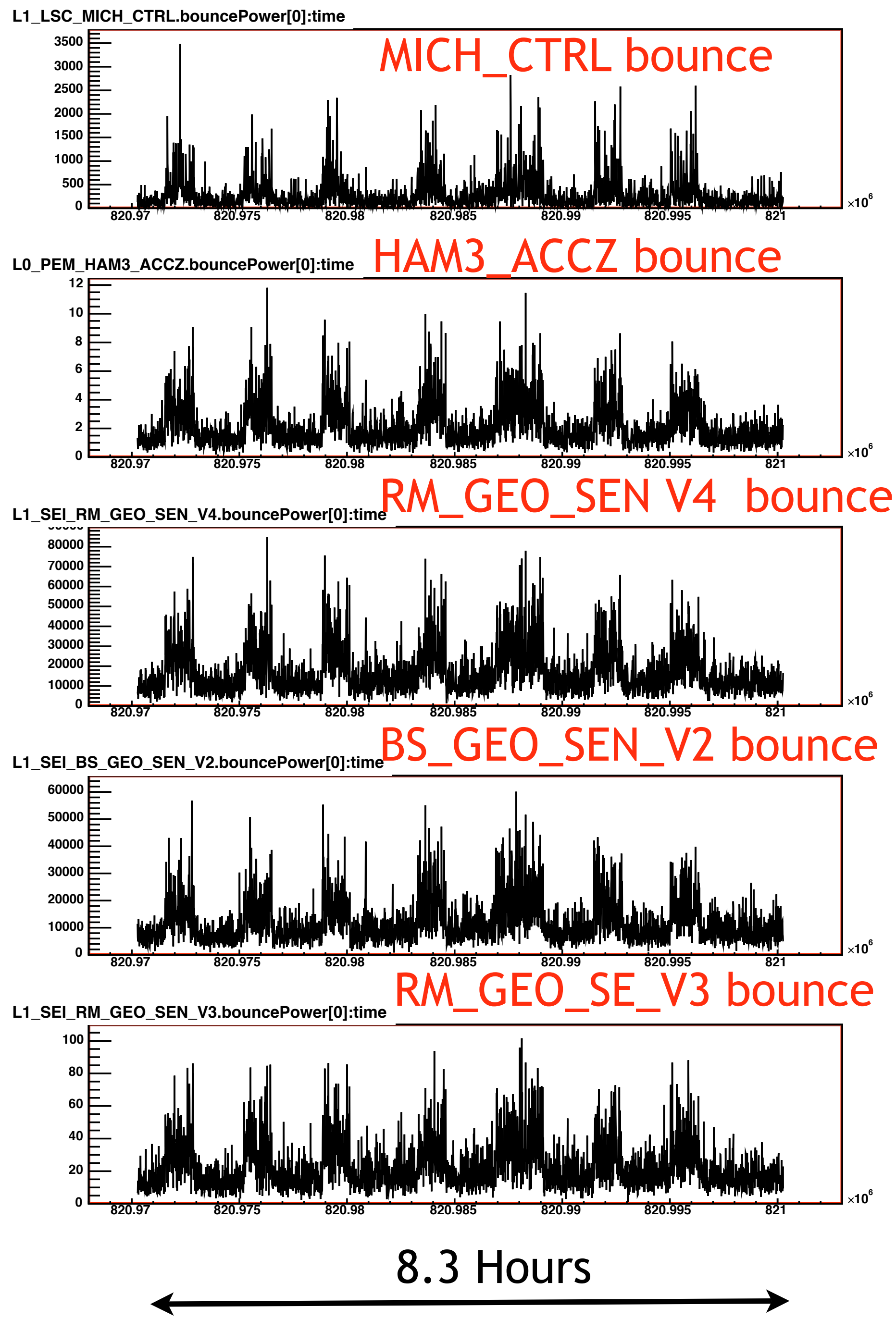
BS?

SR560's thought to be the problem.... they weren't

Channel	Coherence
PEM-HAM3_ACCZ	0.44
SEI-BS_GEO_SEN_V2	0.43
SEI-RM_GEO_SEN_V4	0.43
SEI-RM_GEO_SEN_V3	0.38
SEI-ITMX_GEO_SEN_V2	0.38
SEI-RM_GEO_SEN_V1	0.38
SEI-ITMY_GEO_SEN_V2	0.34
SEI-RM_GEO_SEN_V2	0.33
SEI-MC2_GEO_SEN_V3	0.32
SEI-ITMY_X	0.32
SEI-ITMX_GEO_SEN_V1	0.32
SEI-MC2_GEO_SEN_V4	0.32

Time series

- Definitely correlated
- Don’t know how it gets from accelerometers to MICH
- Quasi-periodic with ON/OFF character
- Possible sources: *HVAC air compressor, De-I water plant, Chillers, Timeshared Air-handling turbine, etc*



Connecting to Data Analyses

Used Laura's bust summary pages to get

"BurstMon Pixel Frac > 4 to 2kHz"

Qualitative correlation between Pixel fraction and bounce mode

Hour-ish period visible in other BurstMon data sets as well.