Enhanced NoiseFloorMon : offline analysis results

R. Stone & S. Mukherjee
Center for Gravitational Wave Astronomy
Department of Physics and Astronomy
University of Texas at Brownsville.

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Outline

- Review NoiseFloorMon
- Describe recent revisions
- Discuss monitor output and channels monitored
- Offline results
- Examine threshold crossings
- To do list

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Introduction

- NoiseFloorMon is a median-based noise floor tracker in operation at L0 and H0
- The monitor tracks slow non-stationarities as opposed to glitches or sharp transients.
- The monitor was developed in 2005 and tested on-site and has been in operation throughout S5

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Changes made …

Earlier :

•Tracking AS_Q.

• Frequency bands: 0-20, 20-100, 100-200 and 200-2048 Hz.

• Percentage threshold crossings are recorded and minute trends stored.

• Offline analysis:

- looking at trends on a daily basis
- comparison with BurstMon output
- activities in different frequency bands
- correlation with SenseMon output

Now :

•Tracking AS_Q and all seismic channels.

•Frequency bands : 0-16, 16-32, 32-64, 64-128 Hz.

•Minute trends of max threshold crossing and cross correlations with the seismic channels stored.

•Offline analysis :

-looking at trends on a daily basis

-studying cross correlations with the seismic channels

-Looks up other monitors for comparison.

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Location of results/ reports … People …

Daily update is made (mostly automated/minimal supervision) and can be accessed at :

www.phys.utb.edu/~soma/MNFTresults/NoiseFloorMon_daily.html

Some analysis results/shift summaries can also be found at :

www.lsc-group.phys.uwm.edu/glitch/investigations/s5index.html

People who have been involved at various stages of this work

S. Mukherjee (algorithm and main code); Roberto Grosso (DMT code); R. Stone (present offline analysis). *Past result web page maintenance : T. Inoue & M. Oyervides (undergraduate students).*

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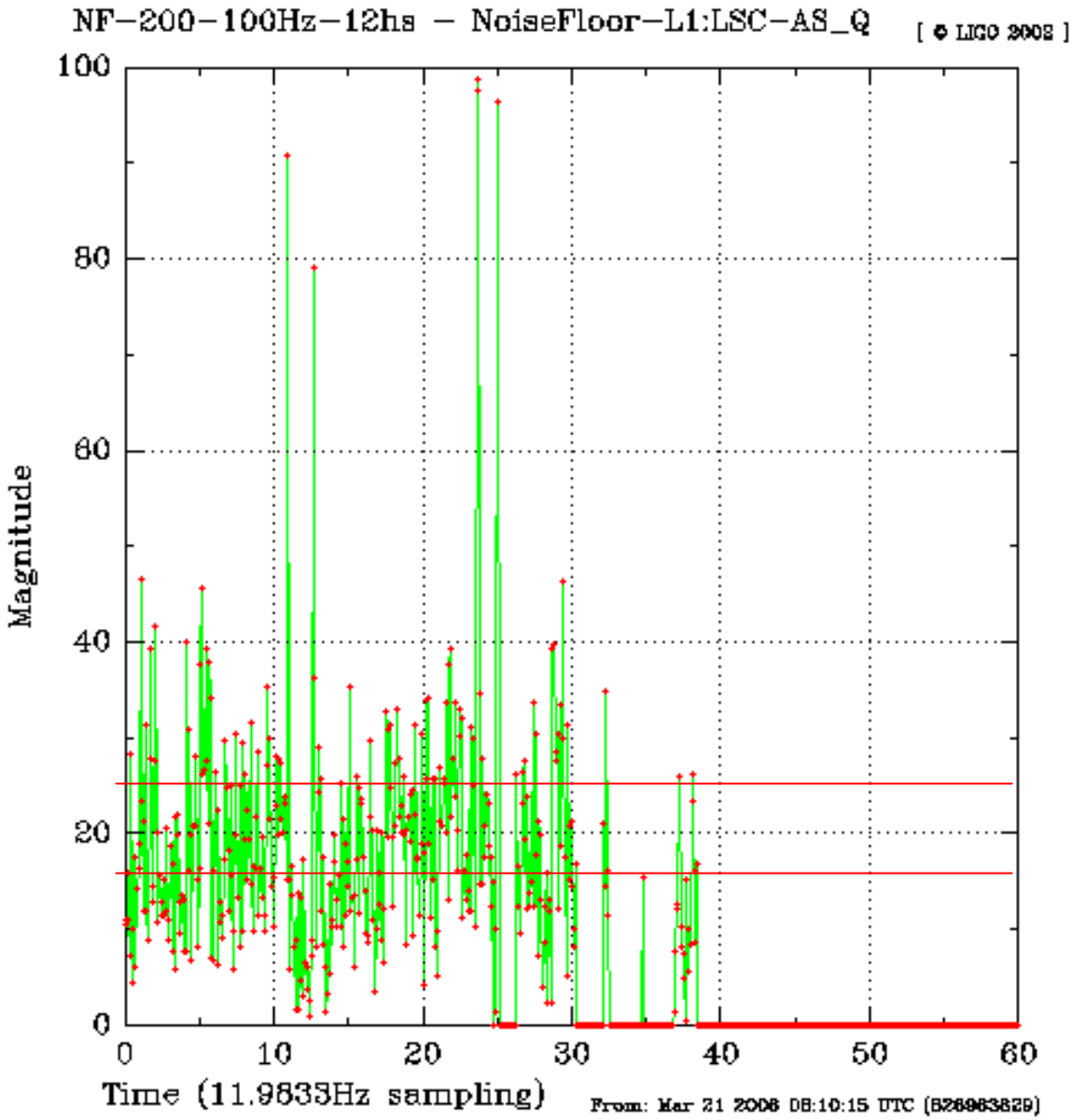
Typical output



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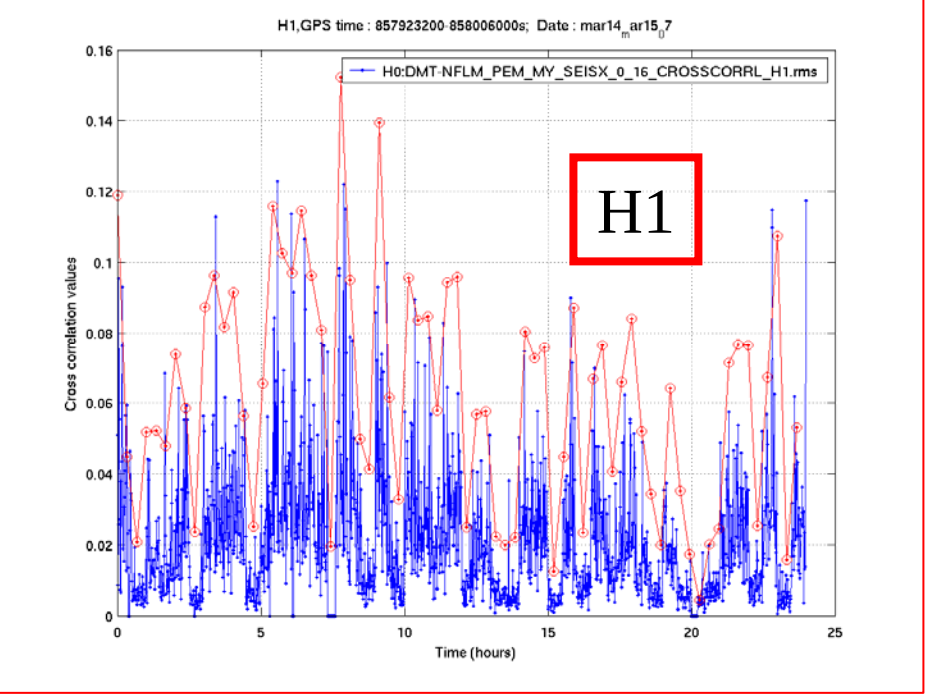
List of auxiliary channels studied

H0:PEM-

EX_SEISX	EY_SEISX
EX_SEISY	EY_SEISY
EX_SEISZ	EY_SEISZ
LVEA_SEISX	MX_SEISY
LVEA_SEISY	MY_SEISX
LVEA_SEISZ	MY_SEISY
MX_SEISX	MY_SEISZ
MX_SEISZ	

L0:PEM-

EX_SEISX	LVEA_SEISY
EX_SEISY	EY_SEISX
EX_SEISZ	EY_SEISY
LVEA_SEISX	EY_SEISZ
LVEA_SEISY	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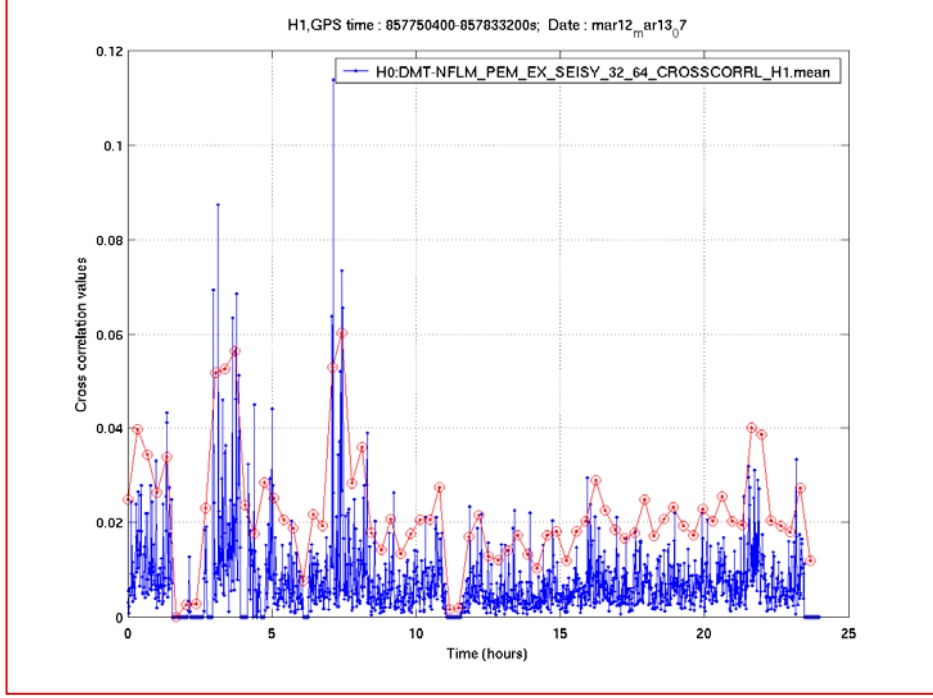
H0:DMT-NFLM_PEM_MY_SEISX_0_16_CROSSCORRL_H1.rms
H1
Cross correlation values
Time (hours)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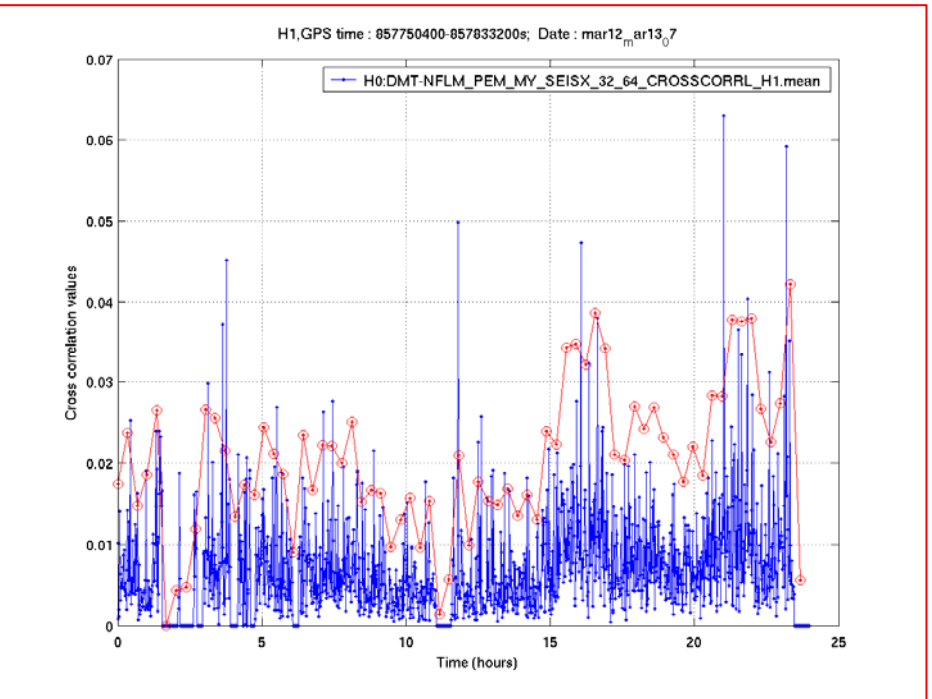
Cross correlation values
Time (hours)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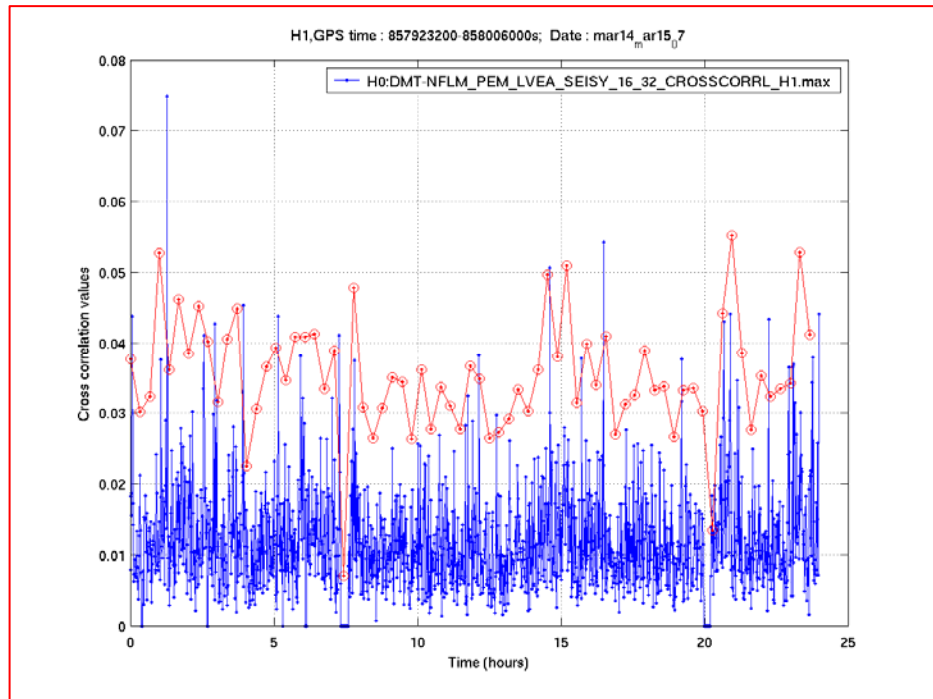
Cross correlation values
Time (hours)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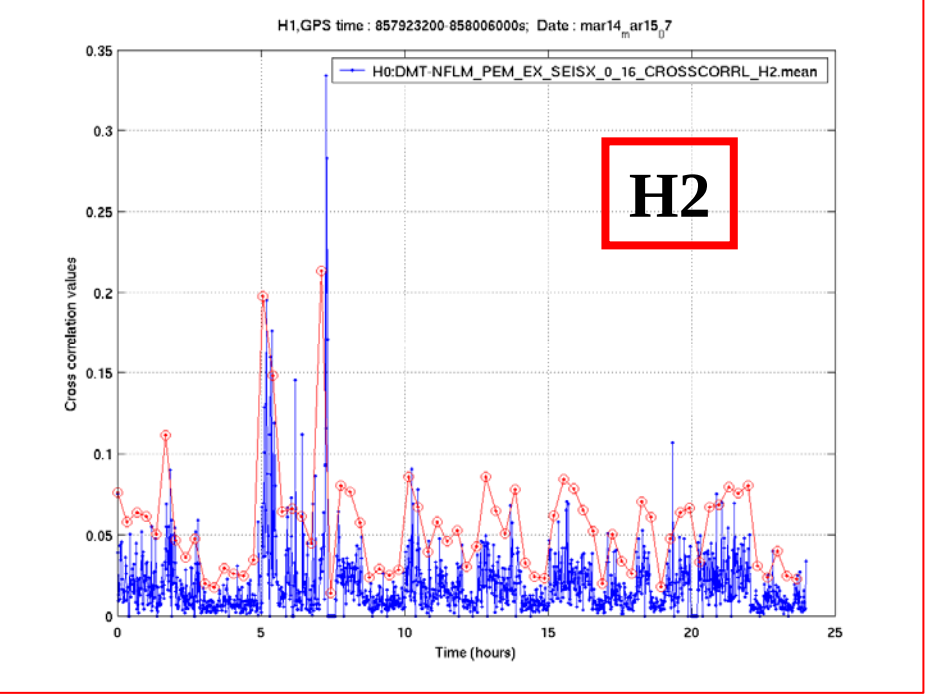
Cross correlation values
Time (hours)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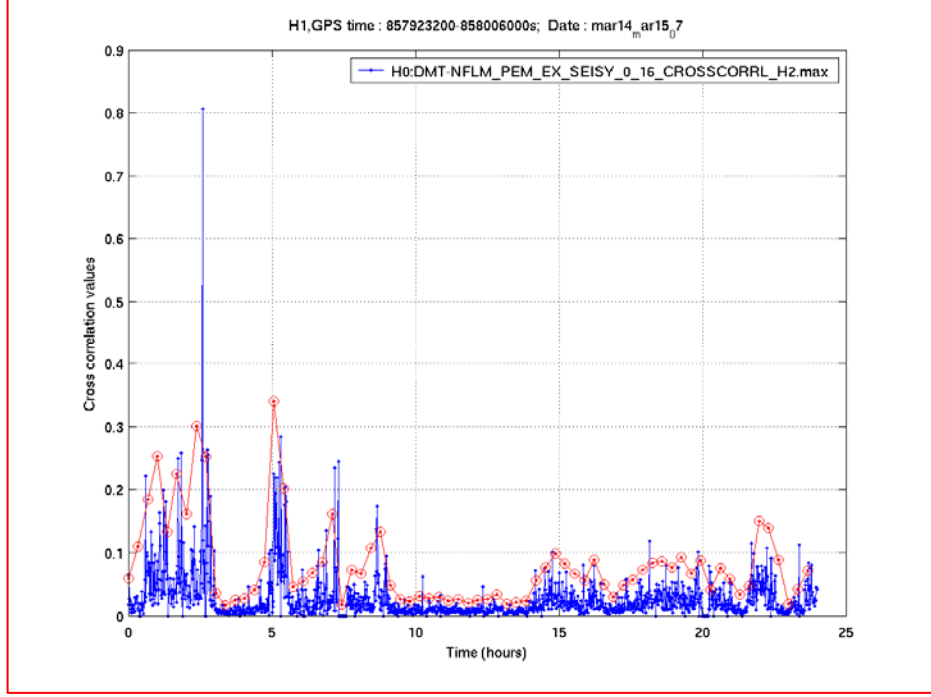
H2
Cross correlation values
Time (hours)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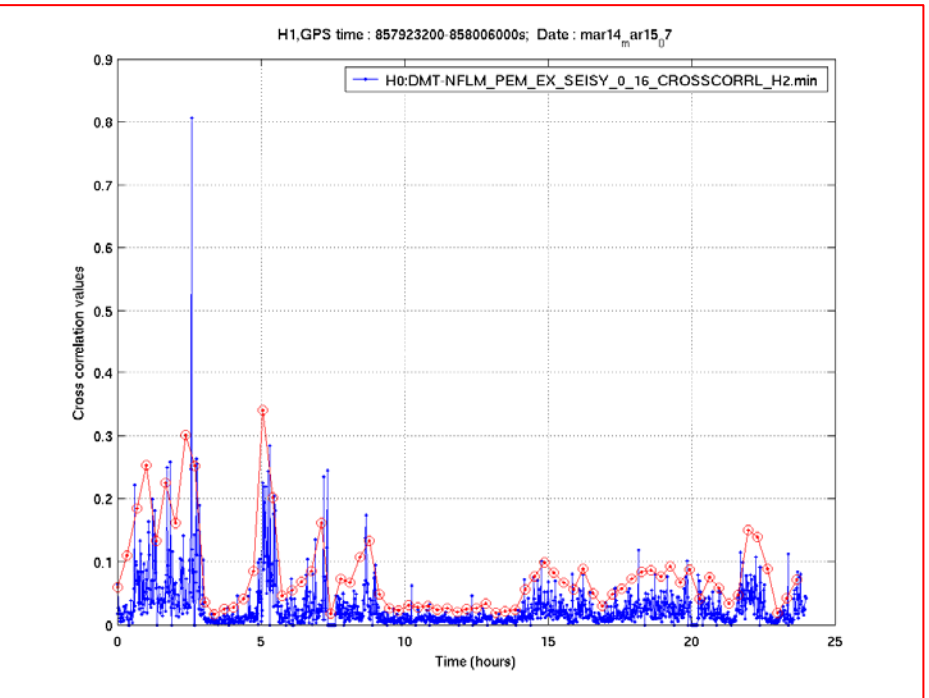
Cross correlation values
Time (hours)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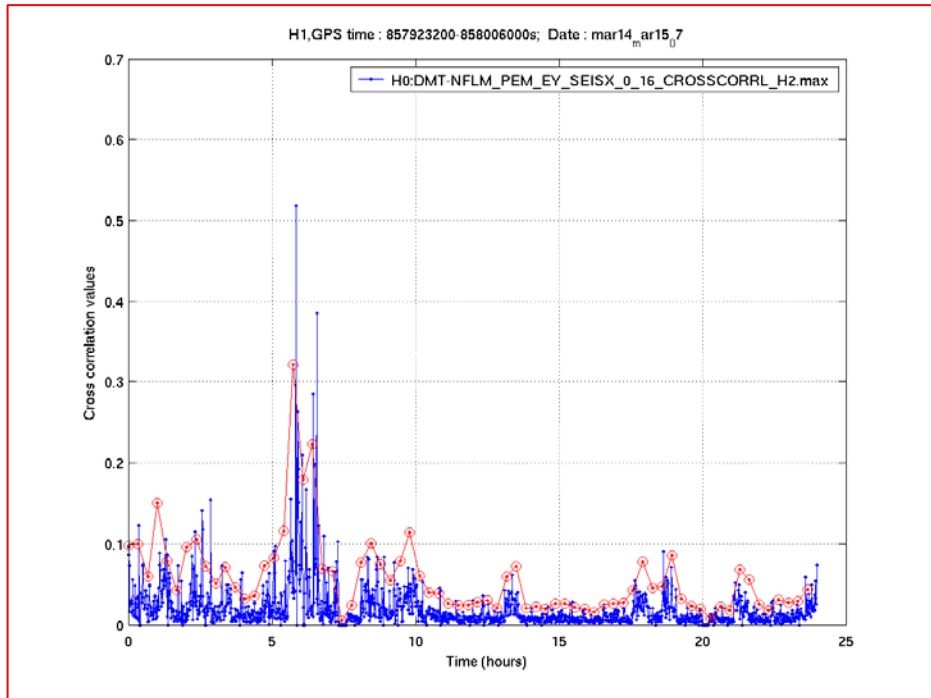
Cross correlation values
Time (hours)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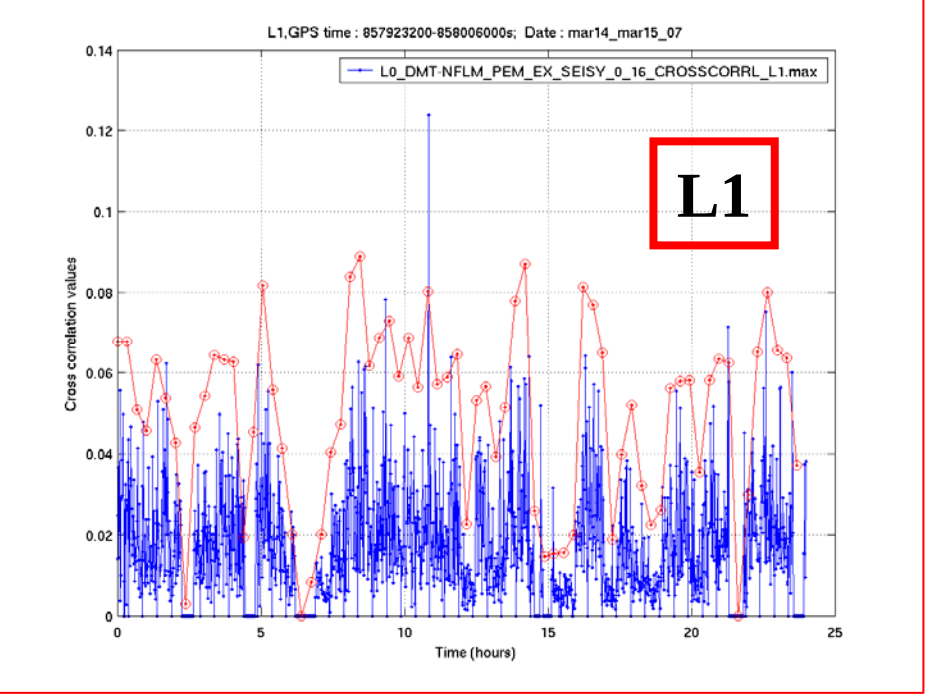
Cross correlation values
Time (hours)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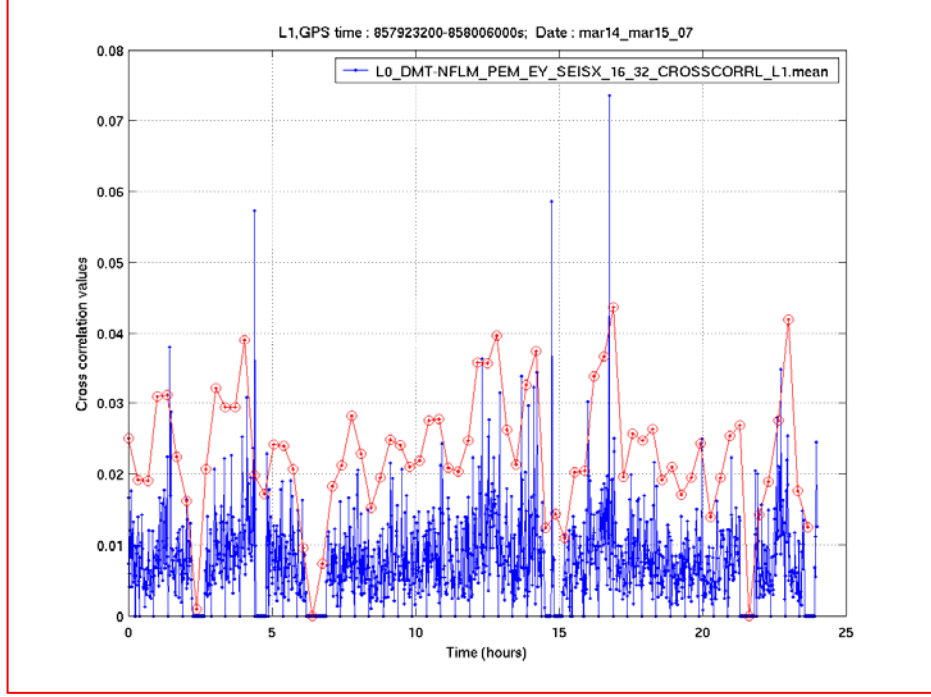
L1
Cross correlation values
Time (hours)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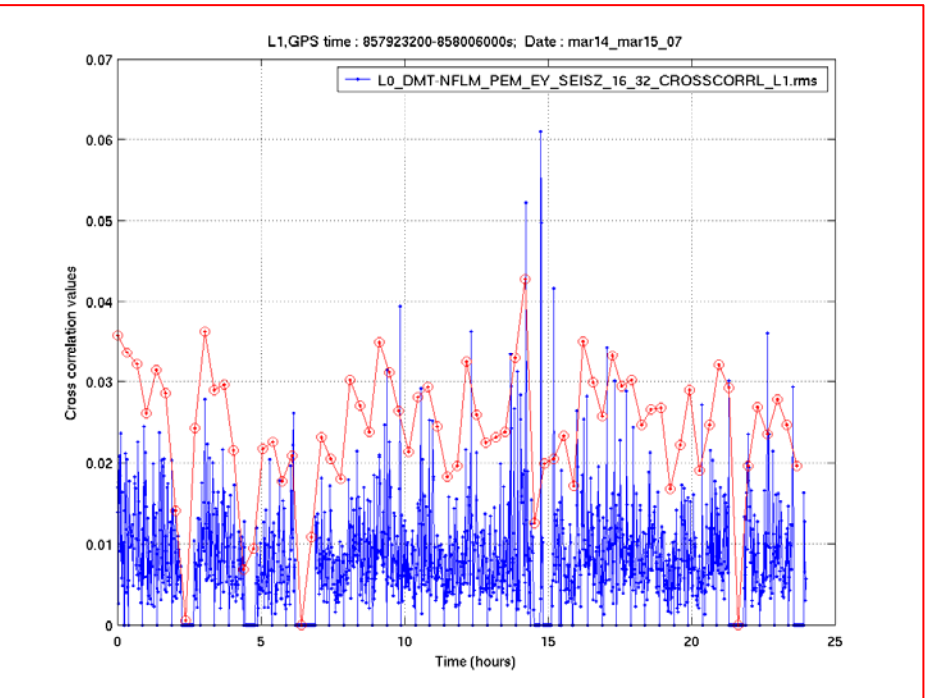
Cross correlation values
Time (hours)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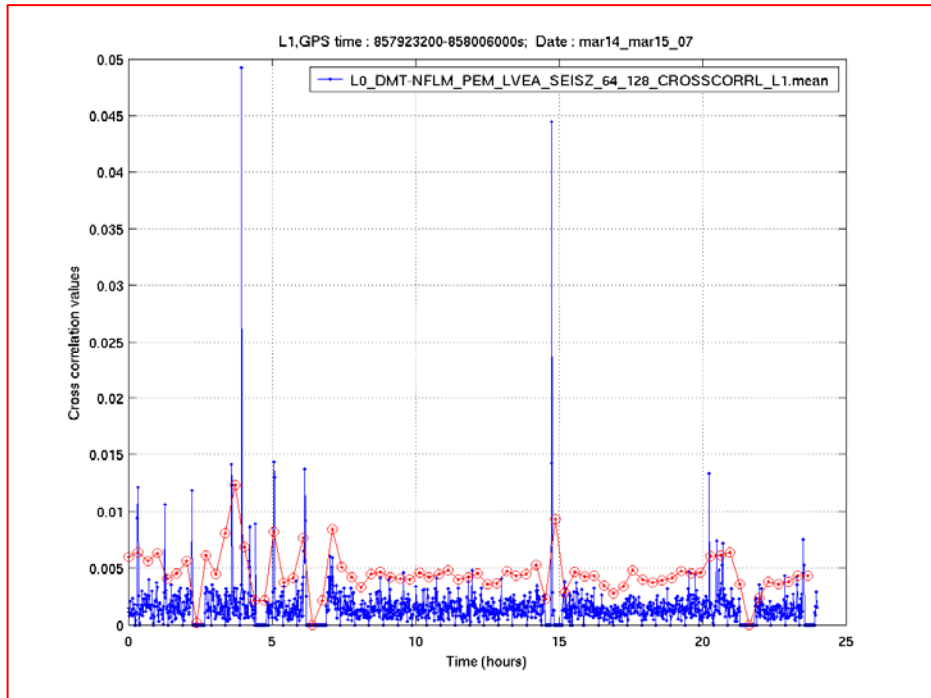
Cross correlation values
Time (hours)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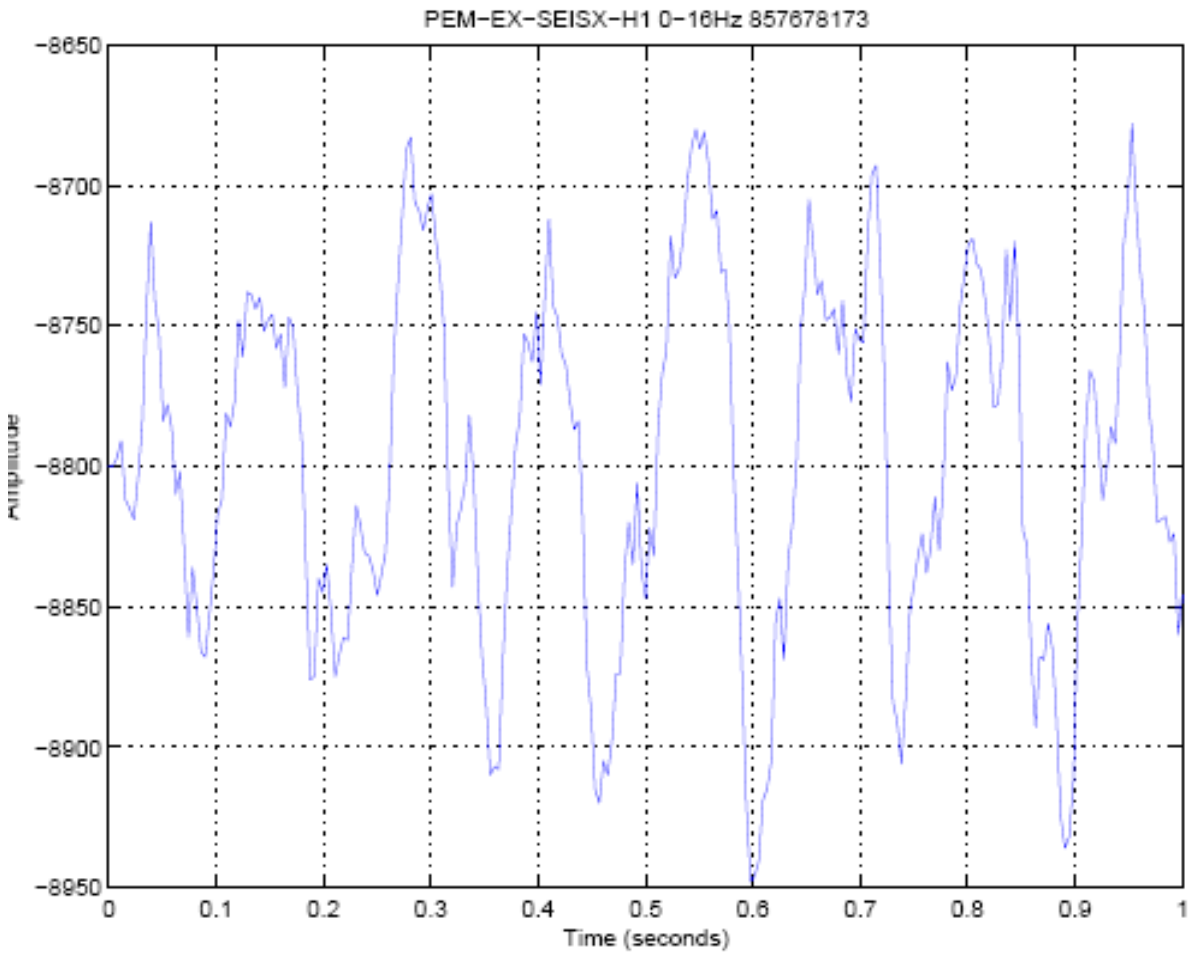
Cross correlation values
Time (hours)

LIGO HO Threshold Crossing 0-16 Hz



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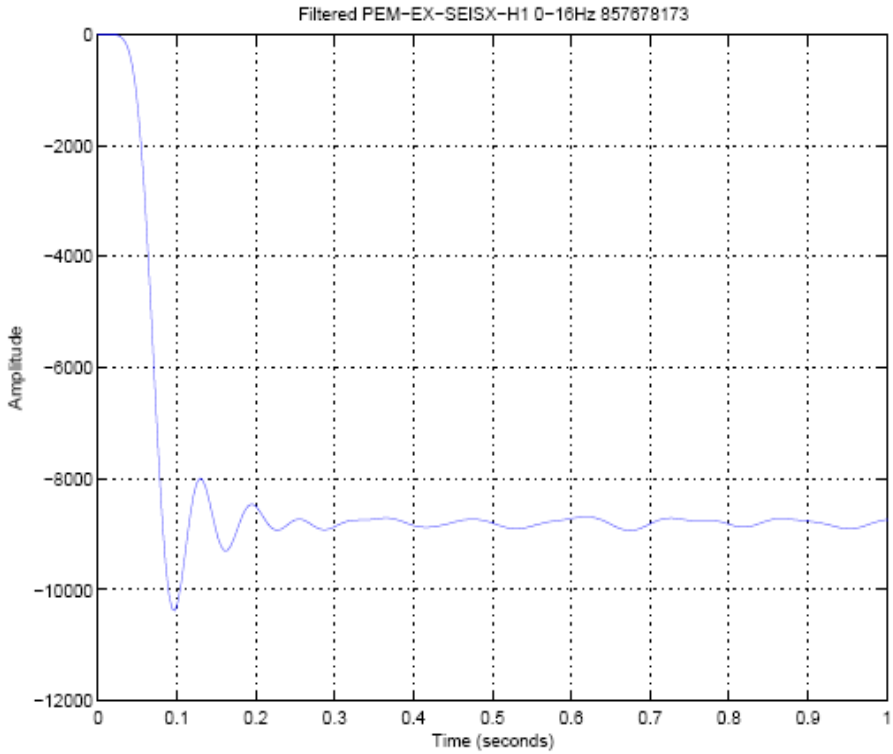
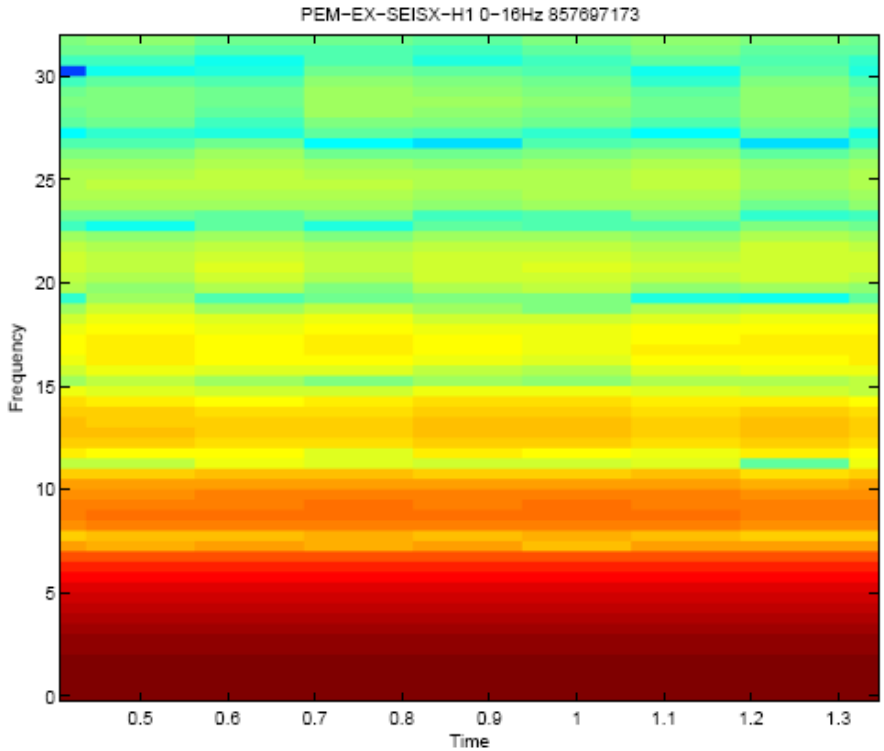
HO Threshold Crossing 0-16 Hz





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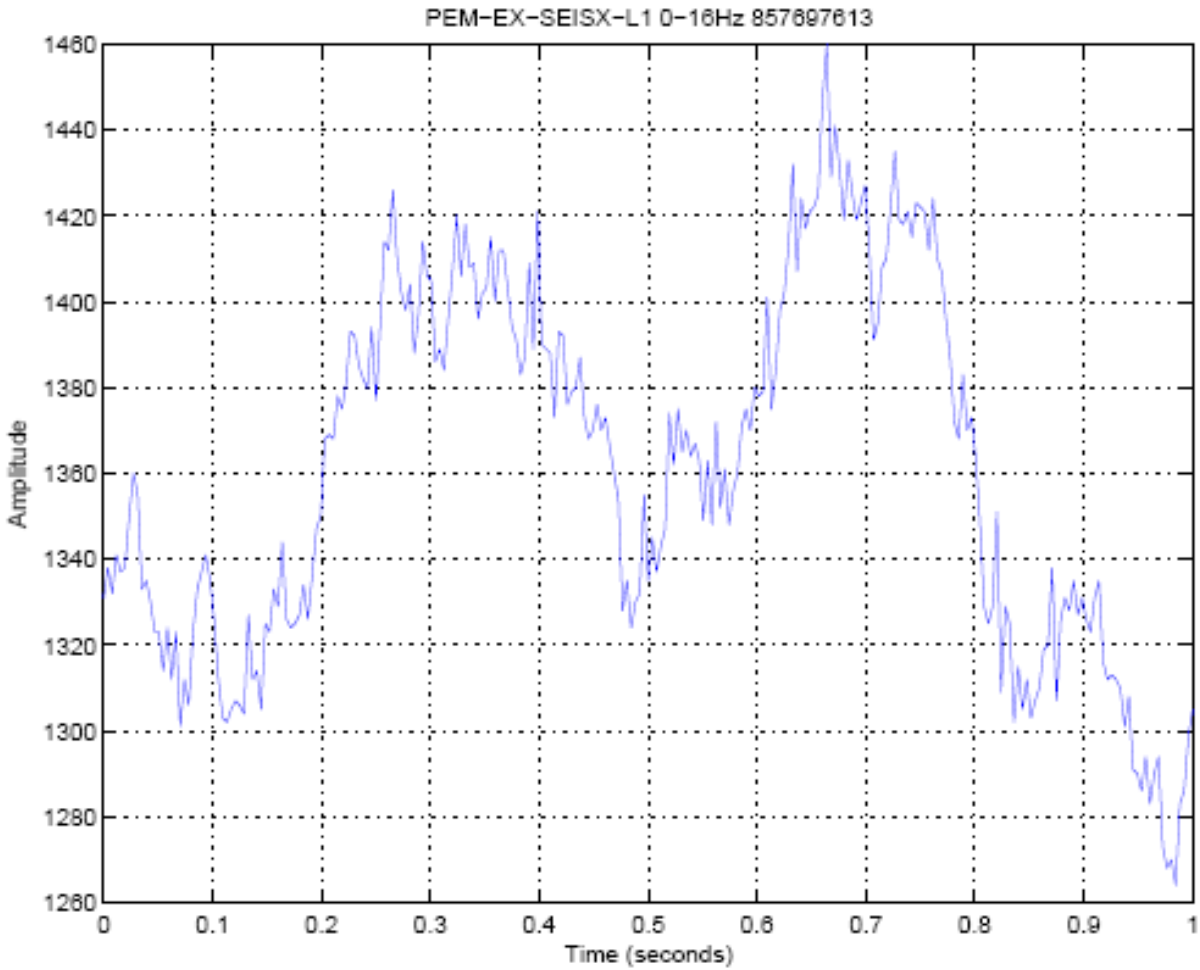
LO Threshold Crossing 0-16 Hz



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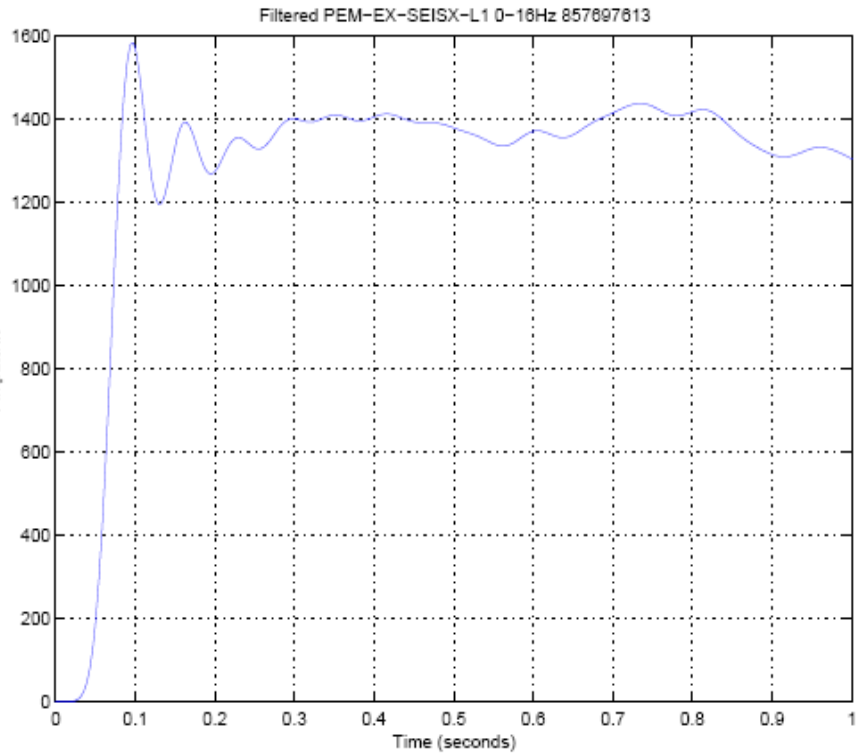

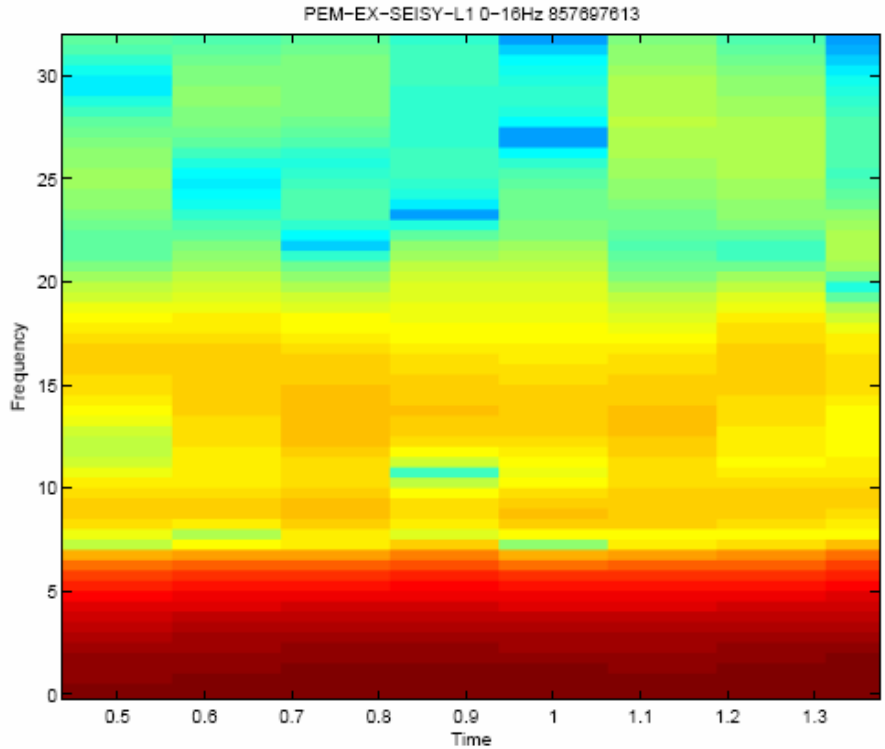

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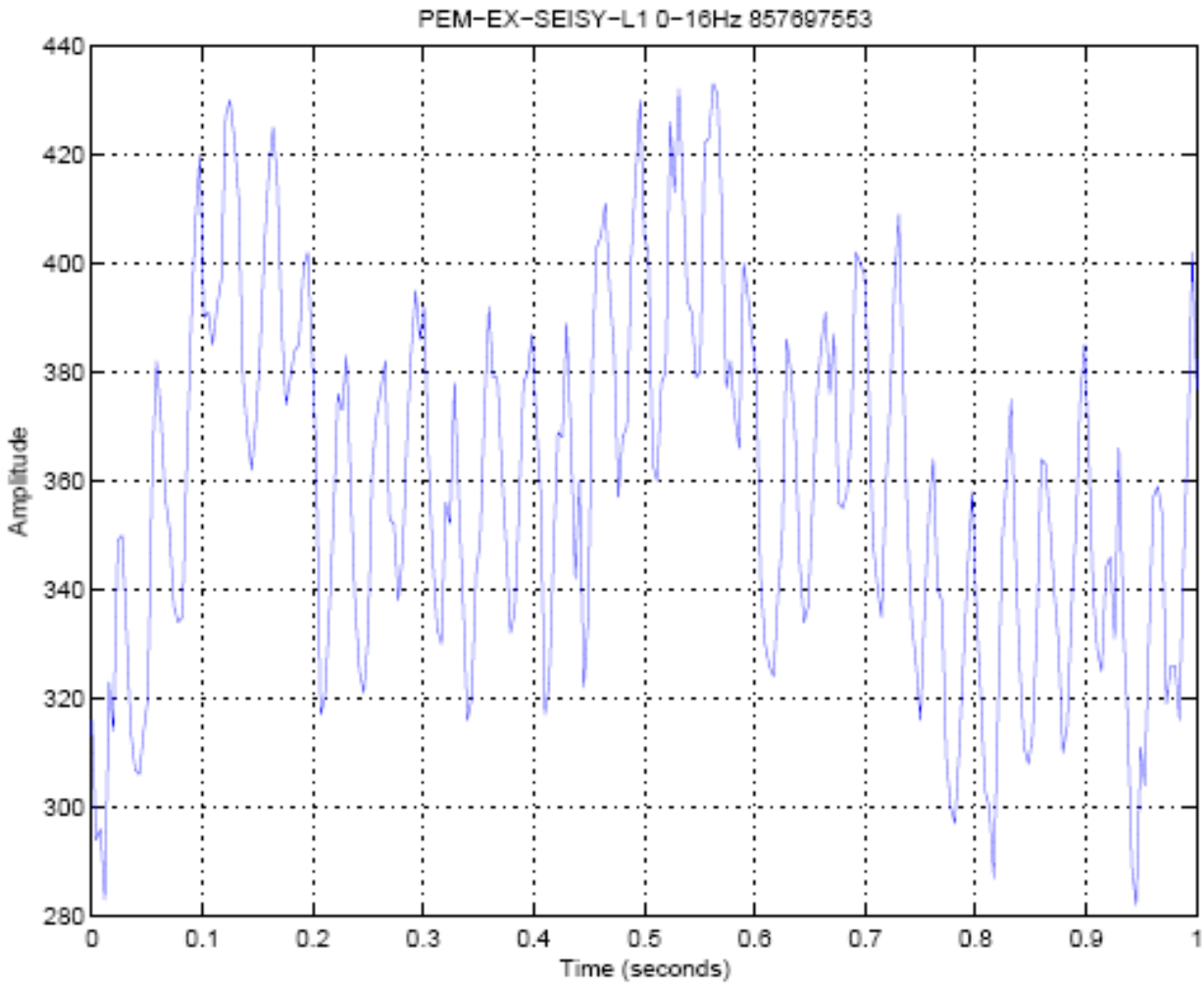
LO Threshold Crossing 0-16 Hz



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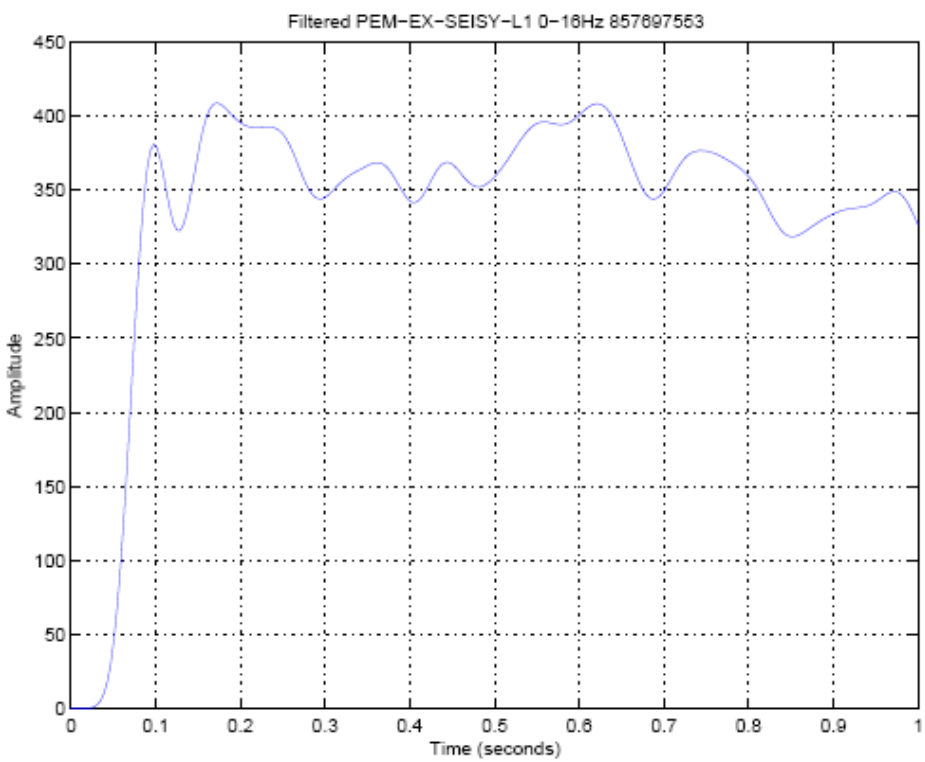
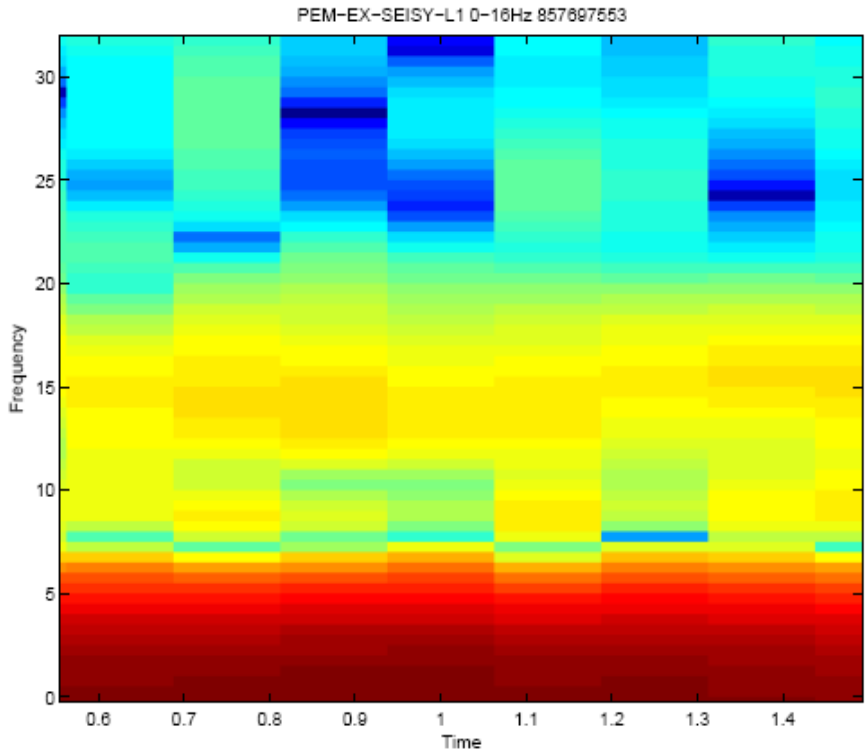
LO Threshold Crossing 0-16 Hz





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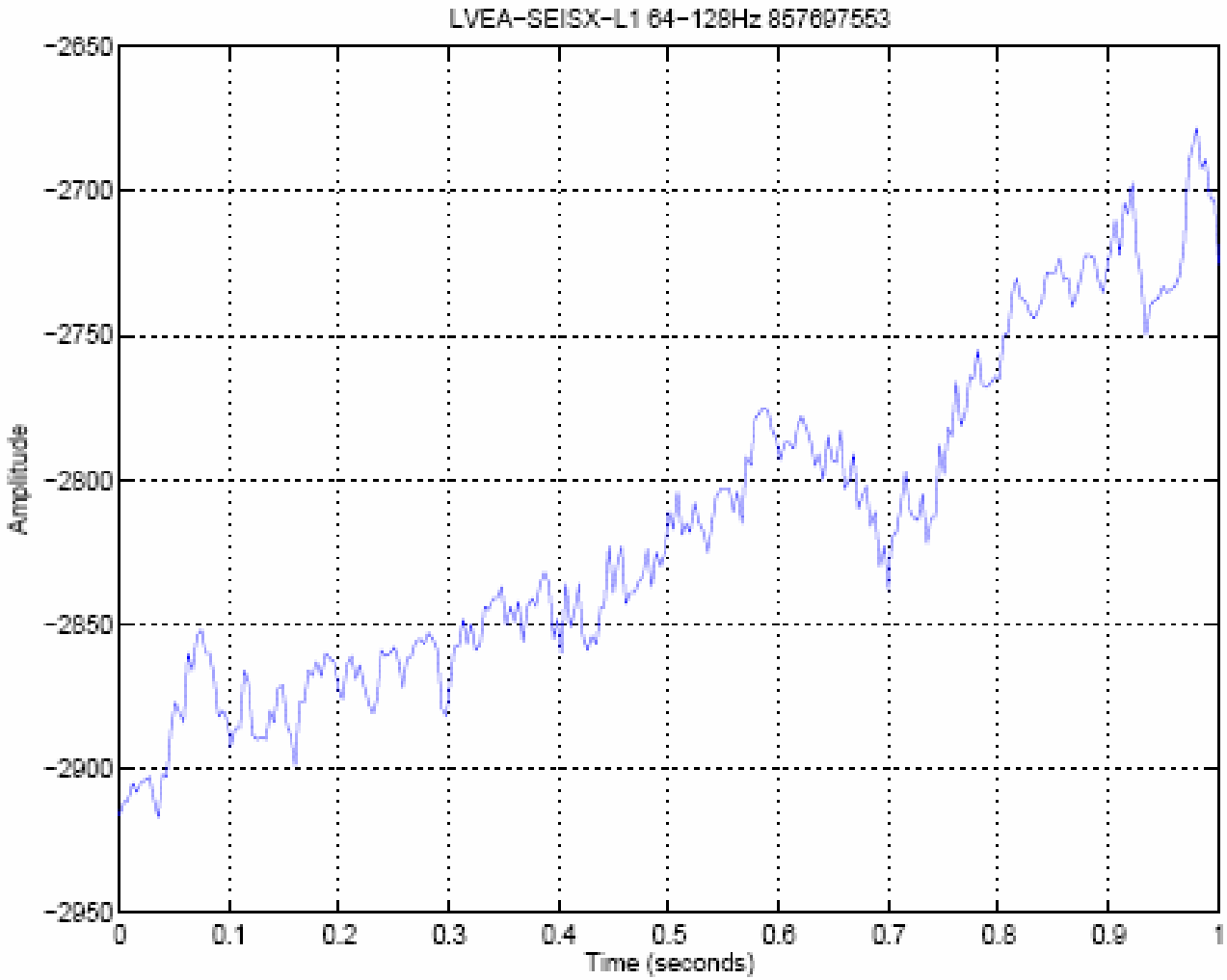
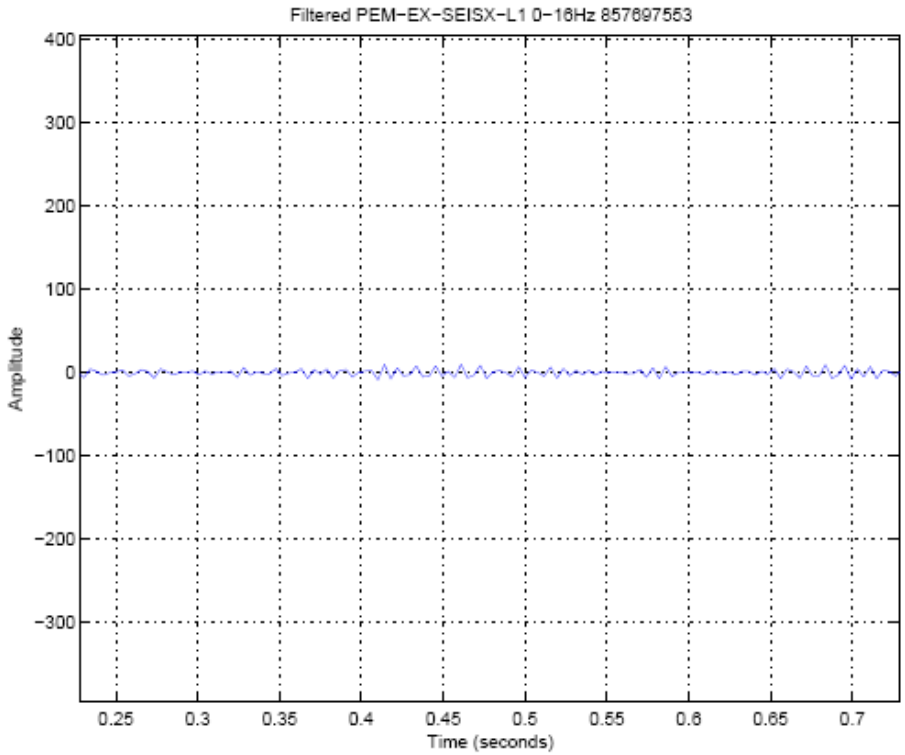
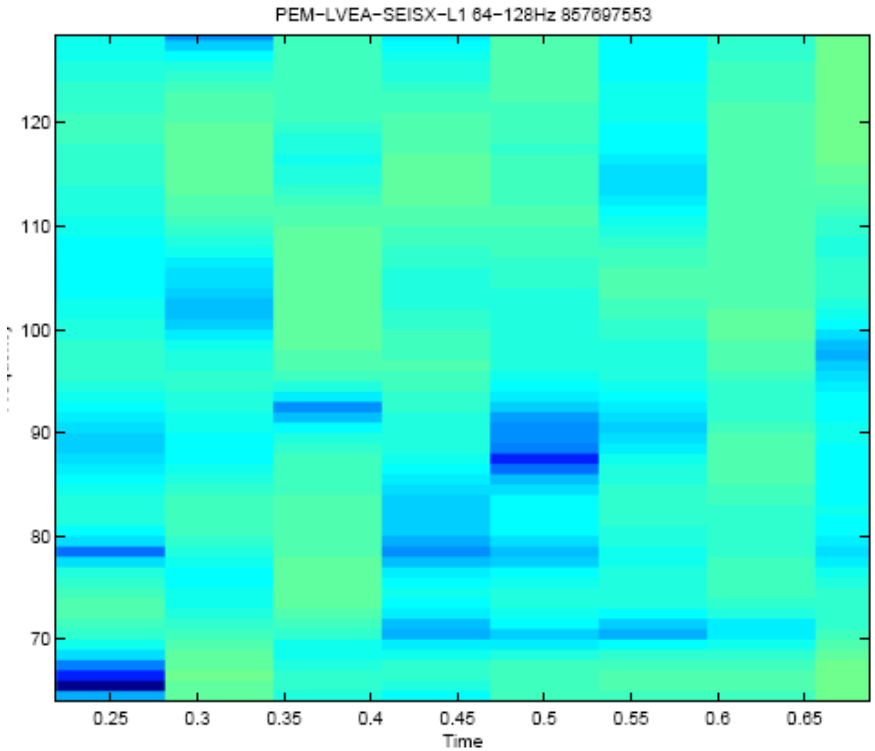
LO Threshold Crossing 64-128Hz



LO Threshold Crossing 64-128 Hz





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Future …

- Continue analyzing S5 and future data.
- Look for correlation with other monitor results.
- Make a time-frequency study to see what actually happened during the threshold crossing epochs leading to understanding the relation between the AS_Q and the auxiliary channel in question.
- Extend the study to micro-seismic band.
- Chart weekly and monthly trends
- A new monitor … MicroseisMon ?