LIGO Channel Activity Monitor (LigoCAM)

LigoCAM: A diagnostic tool for locating malfunctioning auxiliary (PEM) channels, designed for commissioning purposes.

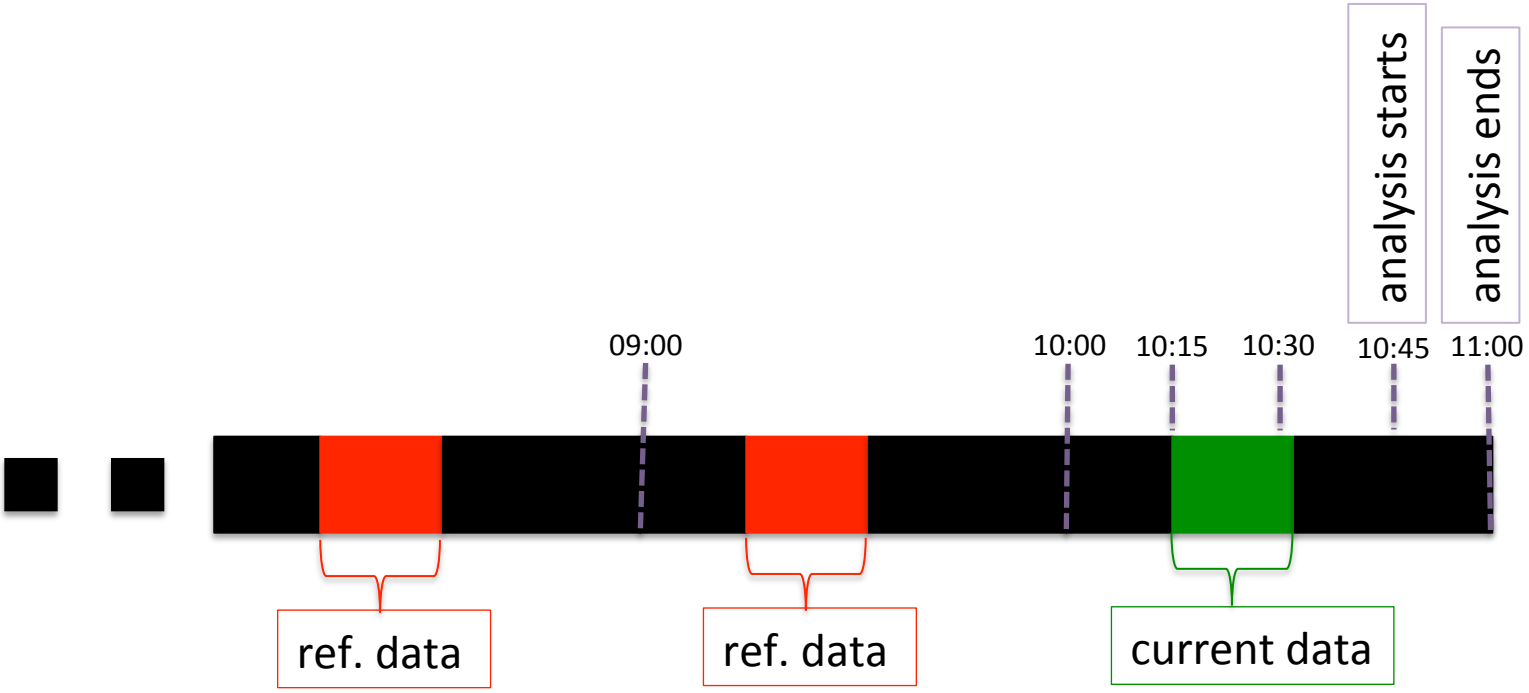
Includes malfunctioning channel name, graphic information of channel's time series and spectral data, and spectral change.

LigoCAM host:
https://ldas-jobs.ligo-wa.caltech.edu/~dtalukder/Projects/detchar/LigoCAM/LigoCAM_host/LigoCAM.html

Uses 1000s band limited spectra every hour.

Band: 0.03-0.1, 0.1-0.3, 0.3-1, 1-3, 3-10, 10-30, 30-100,
100-300, 300-1000, 1000-3000, 3000-10000 Hz.

Reference spectra from past 12 hours “good” data, exponential moving average.



Modes:

(1) Disconnected?: Yes (# of hours) , No

(2) DAQ failure?: Yes (# of hours) , No

(3) BLRMS change?: Yes , No

If any Yes*, then Status Alert (otherwise Ok).

Channel name	Channel info	Image	Status	Disconnected?	DAQ failure?	BLRMS change	0.03-0.1	0.1-0.3	0.3-1	1-3	3-10	10-30	30-100	100-300	300-1000	1000-3000	3000-10000
H1:PEM-CS_ACC_PSL_TABLE2_Z_DQ	link	ASD, TS	Alert	Yes (1e+02 h)	No	Yes	0.000128	8.2e-05	9.26e-05	0.000299	0.00132	0.0141	0.0043	0.00152	0.00468	0.121	
H1:PEM-CS_MAG_EBAY_LSCRACK_X_DQ	link	ASD, TS	Alert	Yes (5 h)	No	Yes	0.00129	0.00132	0.000571	0.000539	0.00107	0.00186	0.000854	0.000375	0.00175	0.00284	0.00747
H1:PEM-EY_MAG_EBAY_SEIRACK_Y_DQ	link	ASD, TS	Alert	Yes (1e+02 h)	No	Yes	0.832	0.487	0.349	0.24	0.193	0.206	0.35	0.665	0.922	0.966	0.97
H1:PEM-EY_MAG_VEA_FLOOR_X_DQ	link	ASD, TS	Alert	Yes (11 h)	No	Yes	5.15	4.74	1.58	0.774	0.678	0.047	0.829	1.21	0.635	1	1
H1:PEM-EY_MAG_VEA_FLOOR_Z_DQ	link	ASD, TS	Alert	Yes (11 h)	No	Yes	2.69	2.04	2.36	2.12	0.921	0.0271	1.16	1.05	0.55	1	1
H1:PEM-EY_MIC_EBAY_RACKS_DQ	link	ASD, TS	Alert	Yes (1e+02 h)	No	Yes	0.00459	0.0025	0.00165	4.13e-06	5.63e-06	7.77e-05	0.000678	0.00109	0.00176	0.00412	0.0102
H1:PEM-EY_MIC_VEA_MINUSY_DQ	link	ASD, TS	Alert	Yes (54 h)	No	Yes	0.0209	0.0108	0.00722	3.52e-05	3.89e-05	0.000255	0.0055	0.105	0.398	0.872	0.995
H1:PEM-EY_MIC_VEA_PLUSY_DQ	link	ASD, TS	Alert	Yes (54 h)	No	Yes	0.0176	0.0111	0.00738	2.13e-05	3e-05	0.000427	0.292	0.058	0.372	0.876	0.953
H1:PEM-EY_TILT_VEA_FLOOR_X_DQ	link	ASD, TS	Alert	No	Yes (1e+02 h)	Yes	0.000196	3.12e-05	1.1e-05	3.24e-06	1.18e-06	3.83e-07	9.07e-08	3.13e-06			
H1:PEM-CS_MAG_EBAY_LSCRACK_Z_DQ	link	ASD, TS	Ok	No	No	Yes	0.854	0.936	0.997	1	0.999	1	0.591	0.0651	0.0848	0.044	0.0556
H1:PEM-CS_MAINSMON_EBAY_1_DQ	link	ASD, TS	Ok	No	No	Yes	0.964	0.901	0.942	1.03	1.02	0.987	1	1.14	0.0978		
H1:PEM-CS_MAINSMON_EBAY_2_DQ	link	ASD, TS	Ok	No	No	Yes	0.905	0.86	0.986	0.96	1.01	0.983	1	1.13	0.0991		
H1:PEM-CS_MAINSMON_EBAY_3_DQ	link	ASD, TS	Ok	No	No	Yes	1.1	0.996	0.999	1	1	0.992	1	1.16	0.1		
H1:PEM-EX_ACC_BSC9_ETMX_Y_DQ	link	ASD, TS	Ok	No	No	Yes	0.0069	0.00893	0.012	0.0128	0.0105	0.19	0.366	0.244	0.206	0.109	0.146
H1:PEM-EX_MAINSMON_EBAY_1_DQ	link	ASD, TS	Ok	No	No	Yes	0.902	0.943	1.02	1.32	1.9	1.47	1	1.24	0.102		
H1:PEM-EX_MAINSMON_EBAY_2_DQ	link	ASD, TS	Ok	No	No	Yes	0.846	0.994	1.27	2	2.39	1.94	1	1.36	0.0967		
H1:PEM-EX_MAINSMON_EBAY_3_DQ	link	ASD, TS	Ok	No	No	Yes	0.828	0.909	1.27	1.64	1.62	1.69	1	1.44	0.099		
H1:PEM-EY_MAINSMON_EBAY_1_DQ	link	ASD, TS	Ok	No	No	Yes	1	0.954	0.987	0.832	0.744	0.754	1	1.29	0.0996		
H1:PEM-EY_MAINSMON_EBAY_2_DQ	link	ASD, TS	Ok	No	No	Yes	0.917	0.941	0.829	0.657	0.548	0.711	1	1.32	0.105		
H1:PEM-EY_MAINSMON_EBAY_3_DQ	link	ASD, TS	Ok	No	No	Yes	1.19	0.96	0.883	0.691	0.571	0.757	1	1.33	0.101		
H1:PEM-MY_SEIS_VEA_FLOOR_Y_DQ	link	ASD, TS	Ok	No	No	Yes	0.00092	0.00304	0.00236	0.0135	0.05	0.243	1.04	0.871			
H1:PEM-MY_SEIS_VEA_FLOOR_Z_DQ	link	ASD, TS	Ok	No	No	Yes	0.0182	0.0942	0.0786	0.178	0.866	1.98	1.04	1.02			
H1:PEM-CS_MAG_LVEA_INPUTOPTICS_X_DQ	link	ASD, TS	Alert	Yes (1e+02 h)	No	No	0.15	0.249	0.262	0.349	0.422	0.41	0.389	0.354	0.351	0.632	0.447
H1:PEM-CS_TILT_LVEA_VERTEX_T_DQ	link	ASD, TS	Alert	Yes (77 h)	No	No	0.9	1.01	0.984	0.992	0.993	0.996	0.996	1			
H1:PEM-CS_TILT_LVEA_VERTEX_X_DQ	link	ASD, TS	Alert	Yes (78 h)	No	No	0.931	0.996	1.11	1.14	1.09	1.06	1.02	1.02			
H1:PEM-CS_TILT_LVEA_VERTEX_Y_DQ	link	ASD, TS	Alert	Yes (85 h)	No	No	0.967	1.02	0.997	0.992	1.01	0.993	0.986	1.01			
H1:PEM-EY_MAG_EBAY_SEIRACK_Z_DQ	link	ASD, TS	Alert	Yes (90 h)	No	No	0.903	0.994	1.26	1.22	1.01	0.985	0.994	0.994	0.991	0.996	0.996
H1:PEM-EY_MAG_EBAY_SUSRACK_X_DQ	link	ASD, TS	Alert	Yes (1e+02 h)	No	No	0.831	0.881	0.984	0.984	0.966	0.446	0.38	0.417	0.556	0.945	0.709
H1:PEM-CS_ACC_BEAMTUBE_MCTUBE_Y_DQ	link	ASD, TS	Ok	No	No	No	33	58.8	30.1	13.4	1.2	1.89	3.14	3.15	3.5	4.89	4.72
H1:PEM-CS_ACC_BEAMTUBE_XMAN_Y_DQ	link	ASD, TS	Ok	No	No	No	10.1	10.4	12.5	14.5	2.11	2.9	4.07	3.55	3.8	3.89	
H1:PEM-CS_ACC_BEAMTUBE_YMAN_X_DQ	link	ASD, TS	Ok	No	No	No	0.093	0.188	0.175	0.422	1.38	5.47	3.43	3.57	4.46	3.6	
H1:PEM-CS_ACC_BSC1_ITMY_X_DQ	link	ASD, TS	Ok	No	No	No	770	516	572	491	105	7.78	10.4	4.97	3.54	3.9	
H1:PEM-CS_ACC_BSC1_ITMY_Y_DQ	link	ASD, TS	Ok	No	No	No	443	804	607	393	77.7	6.2	10.1	3.68	3.61	2.54	2.83

* Currently BLRMS-change is not included in Status.

Disconnect?: Yes/Alert if ASD < ~1e-2 counts/sqrt(Hz) for 10-100 Hz.

DAQ failure?: Yes/Alert if ASD < ~1e-8 counts/sqrt(Hz) for 10-100 Hz.

Exception: SEIS (3-30 Hz), ACC and MIC (10-300 Hz), LOWFMIC and TEMPERATURE (0.03-0.3 Hz, DAQ-failure threshold 1e-4), additionally functioning MAG/MAINSMON expected to have ~1e3 counts/sqrt(Hz) at 60Hz, etc.

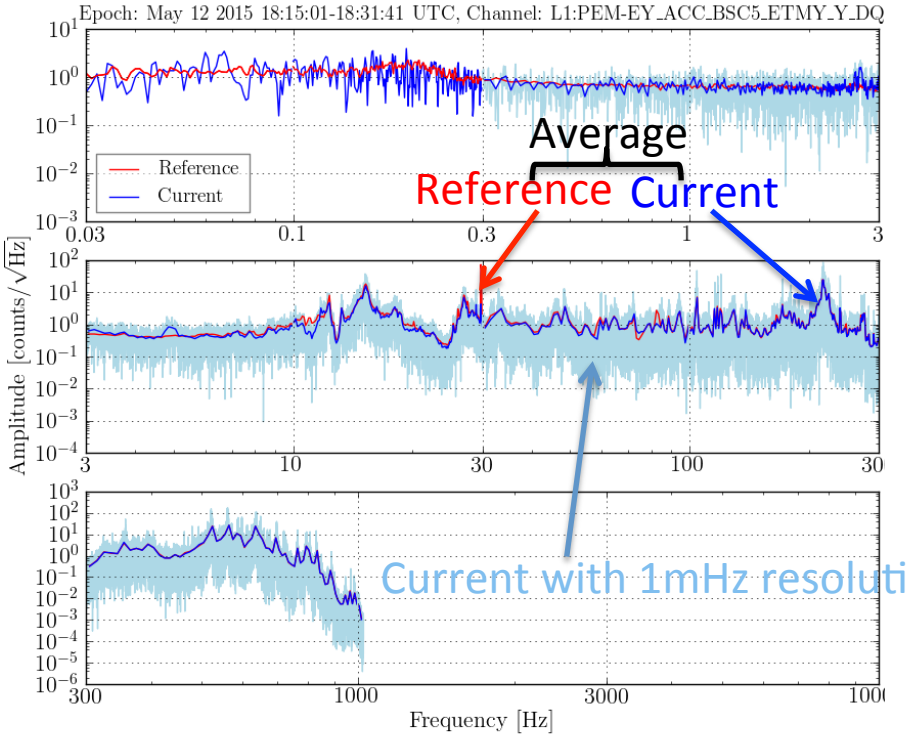
BLRMS change: ASD_tot_cur/ASD_tot_ref,

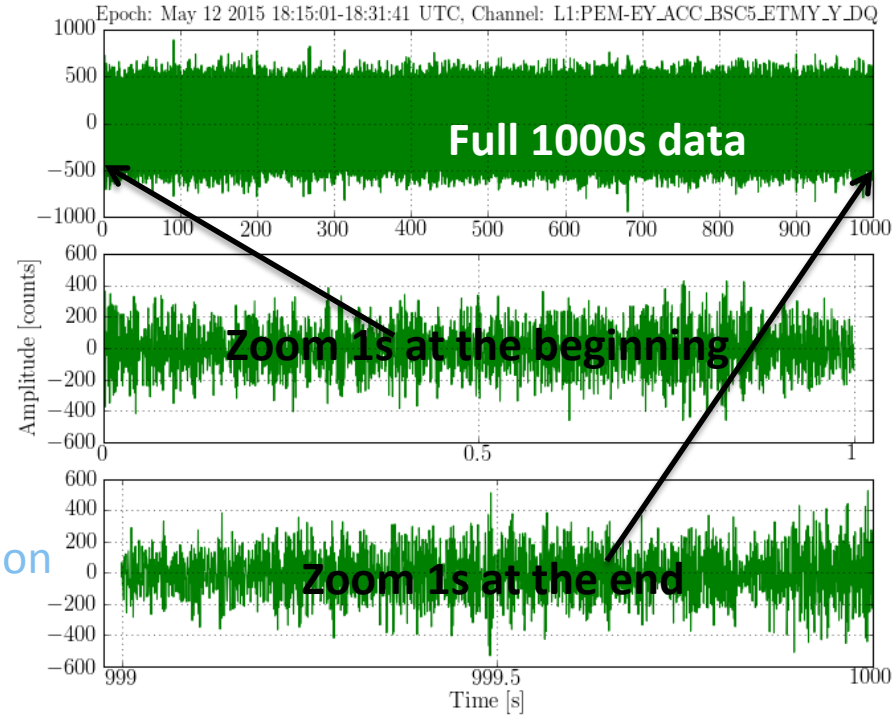
Yes if 1000 < BLRMS < 1/500 for 0.03-1 Hz band

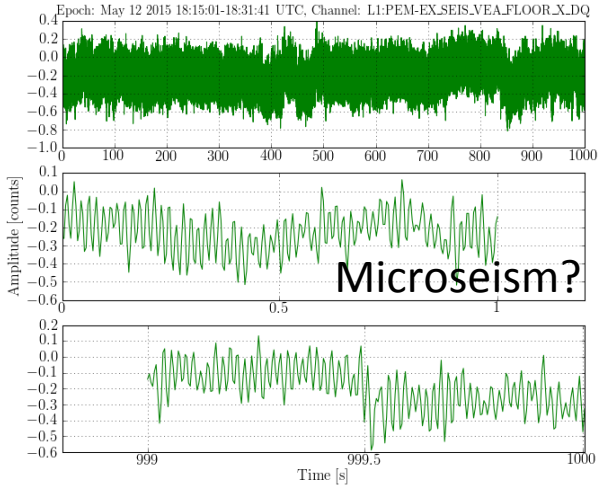
and 50 < BLRMS <1/5 for band > 1 Hz.

Exception: ACC and MIC below 10 Hz and SEIS above 30 Hz ignored.

Interpreting images

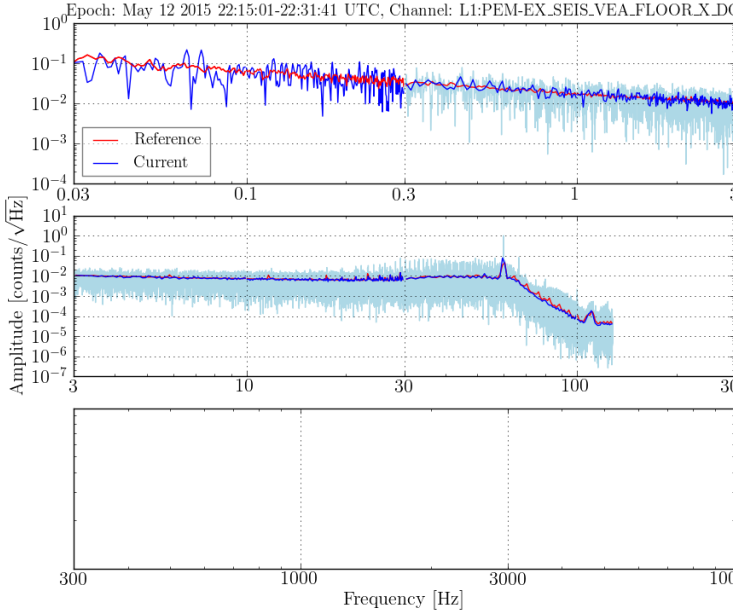


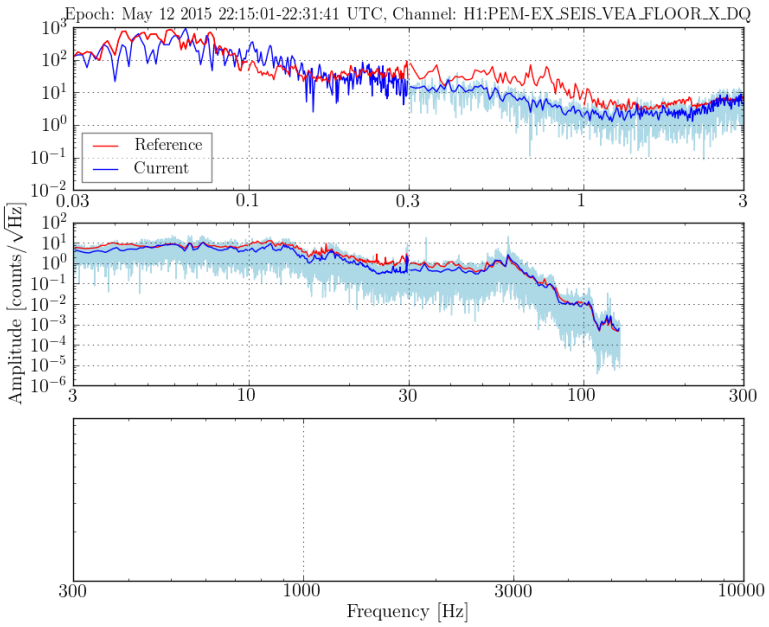




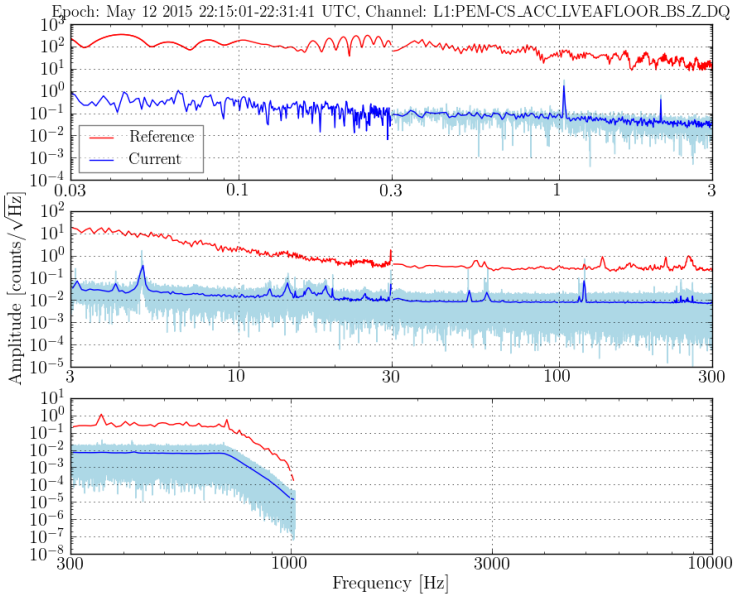
Disconnected vs connected

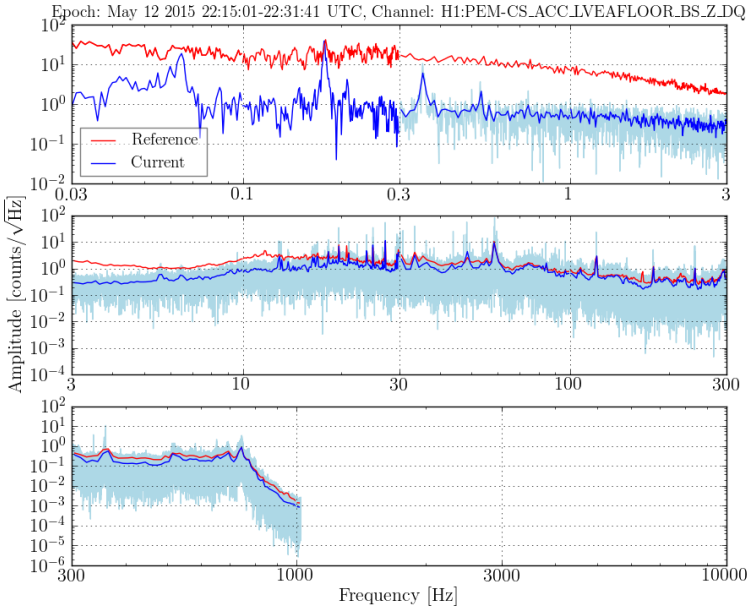
Example 1





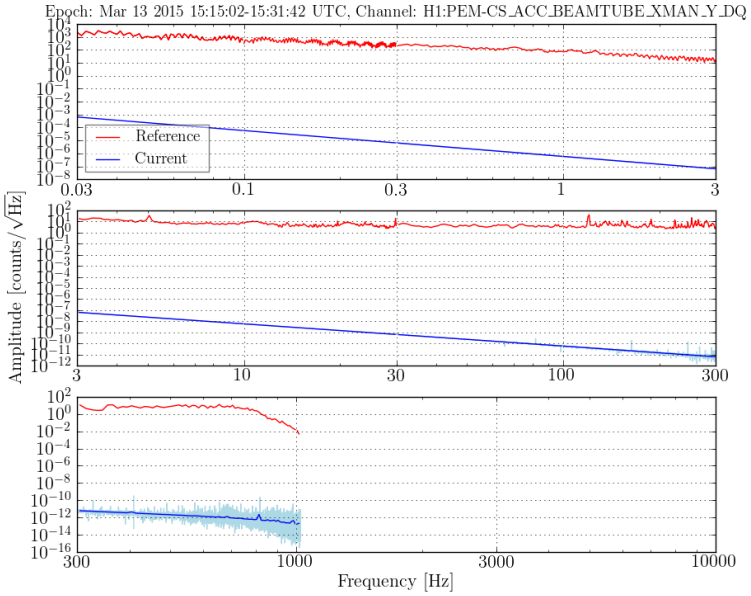
Example 2

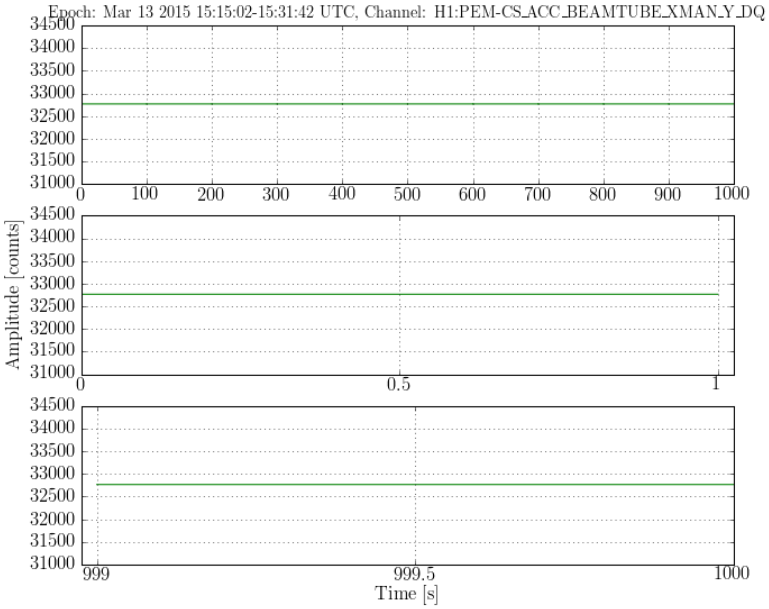




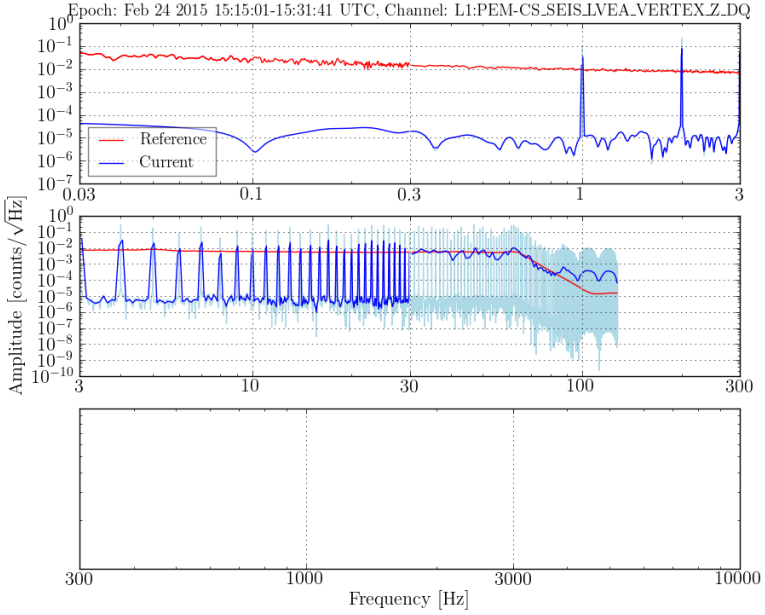
DAQ failure

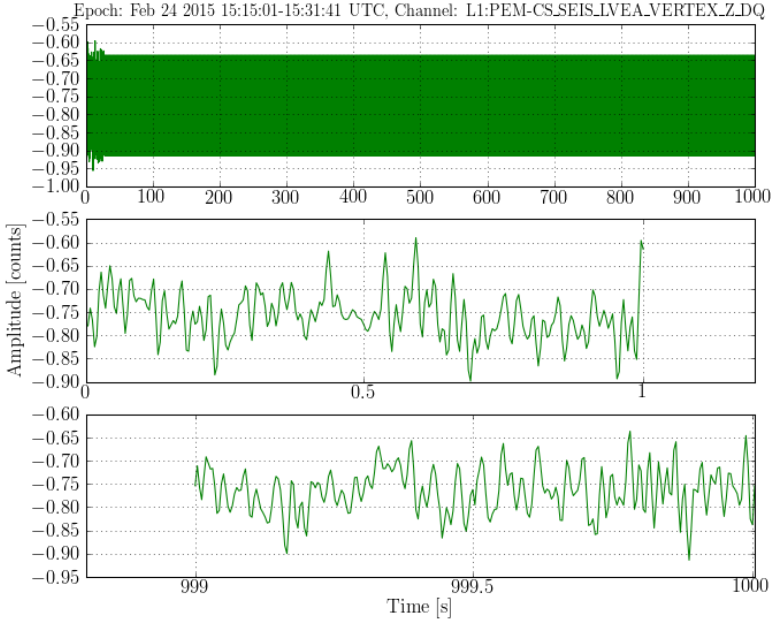
Example 1





Example 2





Checking status
from LigoCAM page and/or PEM Central

LigoCAM host page:

https://ldas-jobs.ligo-wa.caltech.edu/~dtalukder/Projects/detchar/LigoCAM/LigoCAM_host/LigoCAM.html

Or, LHO PEM

https://ldas-jobs.ligo-wa.caltech.edu/~dtalukder/Projects/detchar/LigoCAM/LigoCAM_host/LigoCAM_PEM_LHO.html

and LLO PEM

https://ldas-jobs.ligo-wa.caltech.edu/~dtalukder/Projects/detchar/LigoCAM/LigoCAM_host/LigoCAM_PEM_LLO.html

PEM Central:

http://pem.ligo.org/