

aLOG(LLO) report

7/21 – 7/28

Ayaka Shoda

PSL antenna

<https://alog.ligo-la.caltech.edu/aLOG/index.php?callRep=19131>

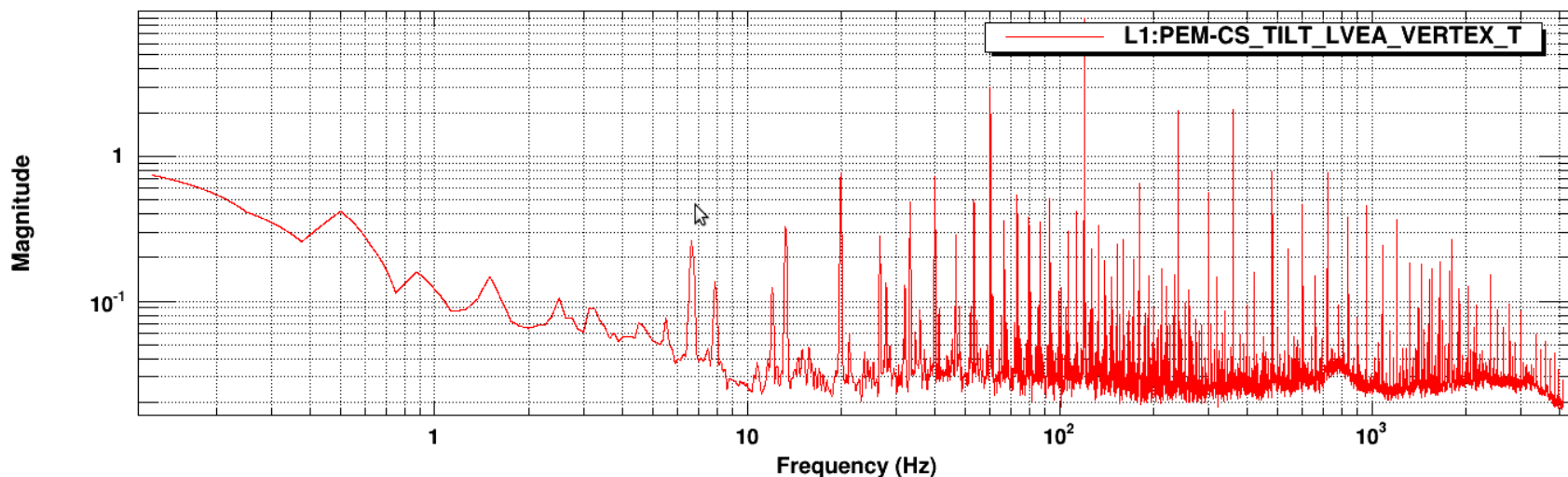
'whistle noise' is caused by the some RF source beating with PSL-VCO?



They have set a half-wavelength dipole antenna behind the ISC racks in order to monitor the RF spectrum near the PSL-VCO freq.

Power spectrum

Spectrum of the data from antenna demodulated with PSL-VCO signal.

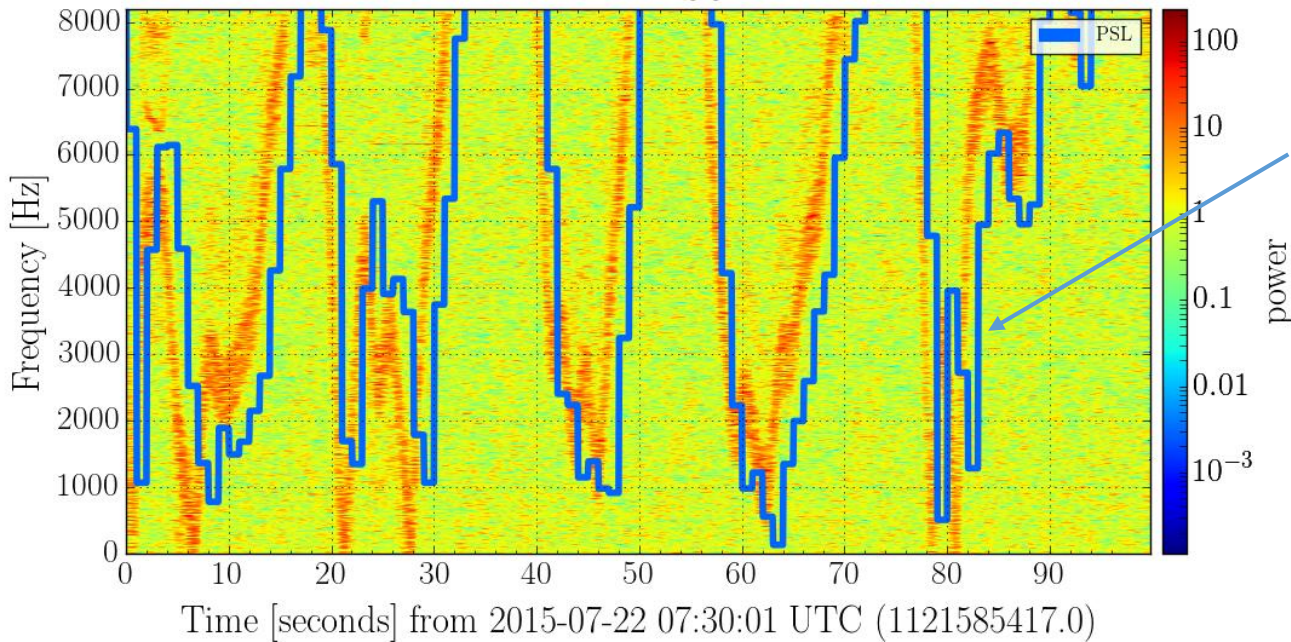


RF line near PSL VCO

<https://alog.ligo-la.caltech.edu/aLOG/index.php?callRep=19272>

Spectrogram of the signal from the antenna demodulated with PSL-VCO

L1 radio near ISC racks



PSL VCO frequency
- 78.984 MHz.



Something with
the frequency of ~ 79 MHz
must be the culprit!!

Note: the data is normalized by the median in the each row.
this is why we cannot see any stationary lines.

This time, DARM spectra don't indicate a whistle.

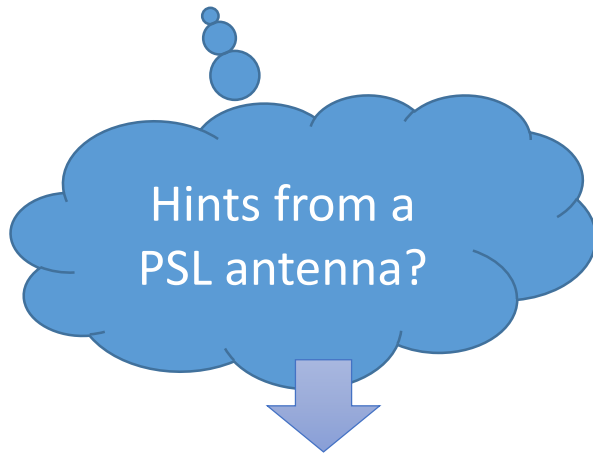


Do it again when a whistle is in DARM.

RF beat notes @ 7/27

<https://alog.ligo-la.caltech.edu/aLOG/index.php?callRep=19316>

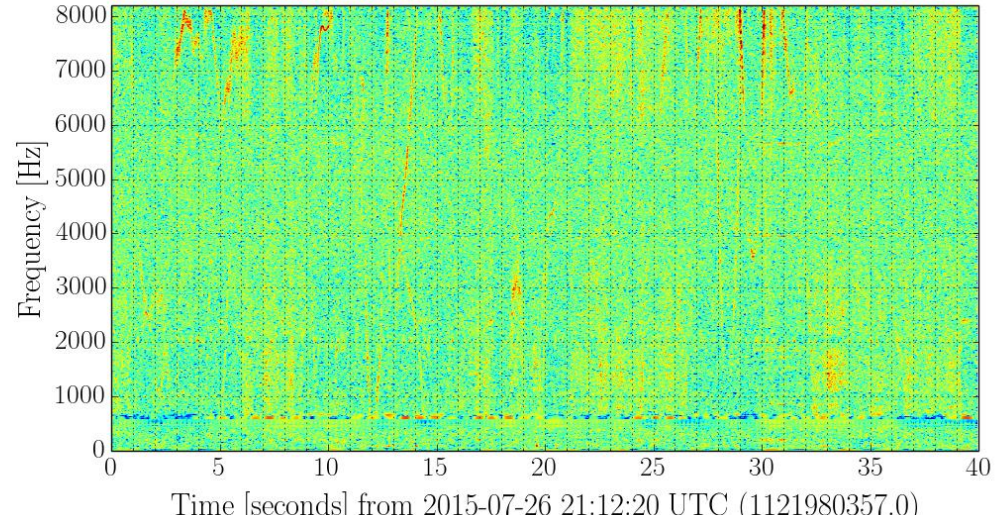
They found the beat notes in DARM and PRC.



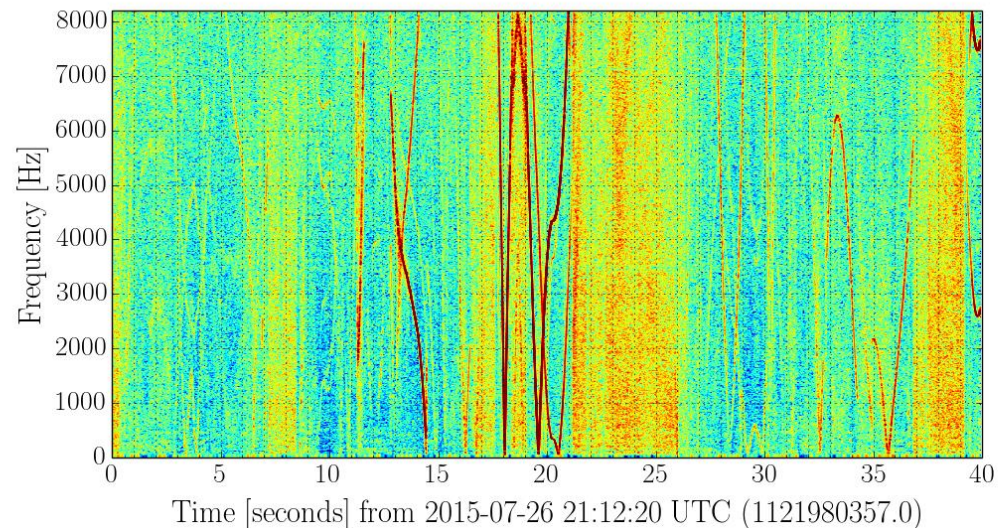
The data from antenna seems to have no signals.

There was not information.

Beat note in DARM



Beat note in PRCL

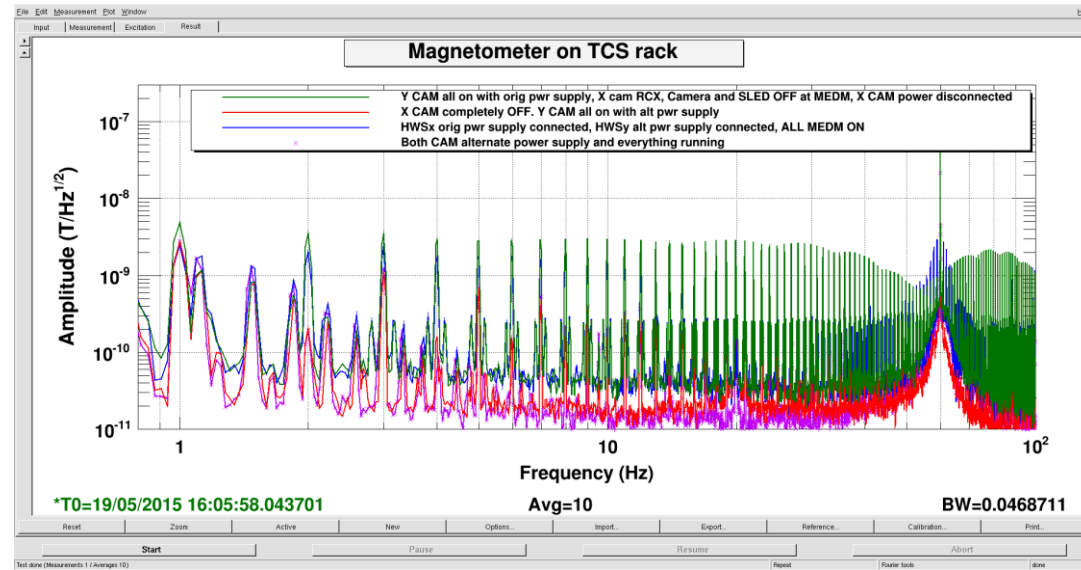
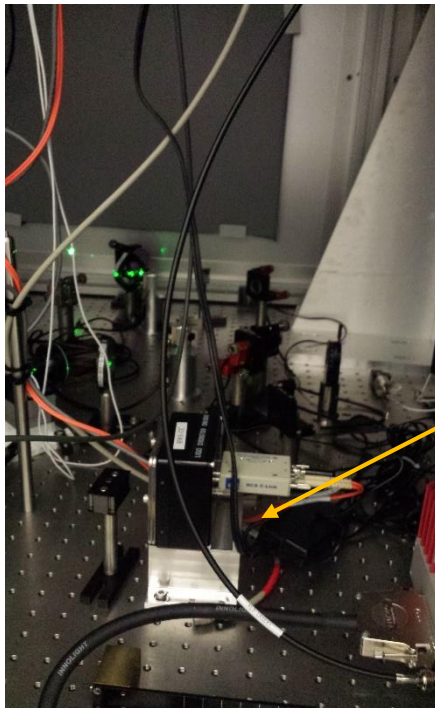


Power adopters for HWS

<https://alog.ligo-la.caltech.edu/aLOG/index.php?callRep=19223>

When HWS is operated, there is a 1 Hz signal in DARM.

Hartmann wave-front sensor for the thermal compensation system.



Installed a new power supplies

New L1odcmaster model

<https://alog.ligo-la.caltech.edu/aLOG/index.php?callRep=19216>

Previously, timing errors occur in RT system.

It is necessary to reduce the cycle time for the current logic.

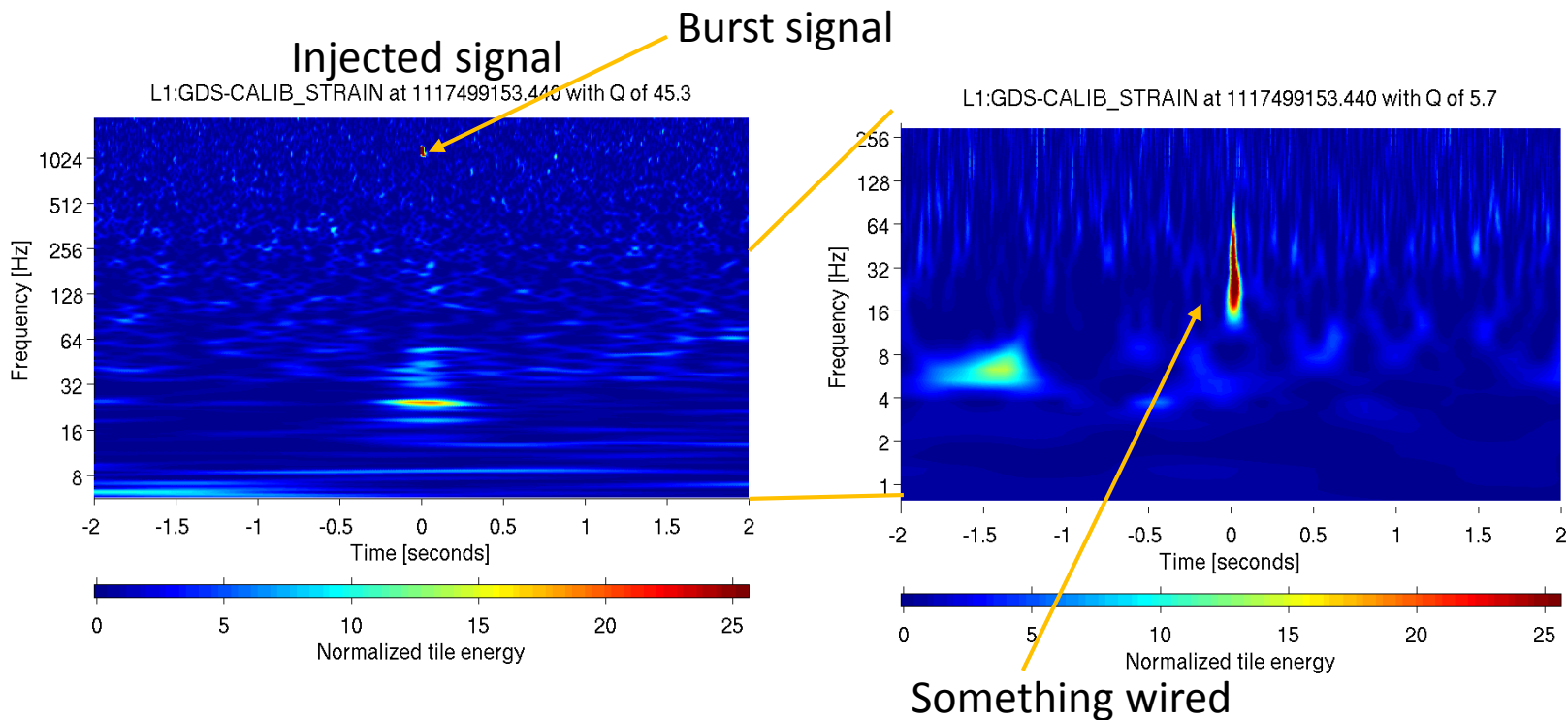


New ODC-MASTER logic installed for the temporal solution.

Glitch caused by the burst injection

<https://alog.ligo-la.caltech.edu/aLOG/index.php?callRep=18661>

The burst group failed to recover the one of their parameter of a loud burst injection.



It seems to be because of the saturation of the actuation signal.

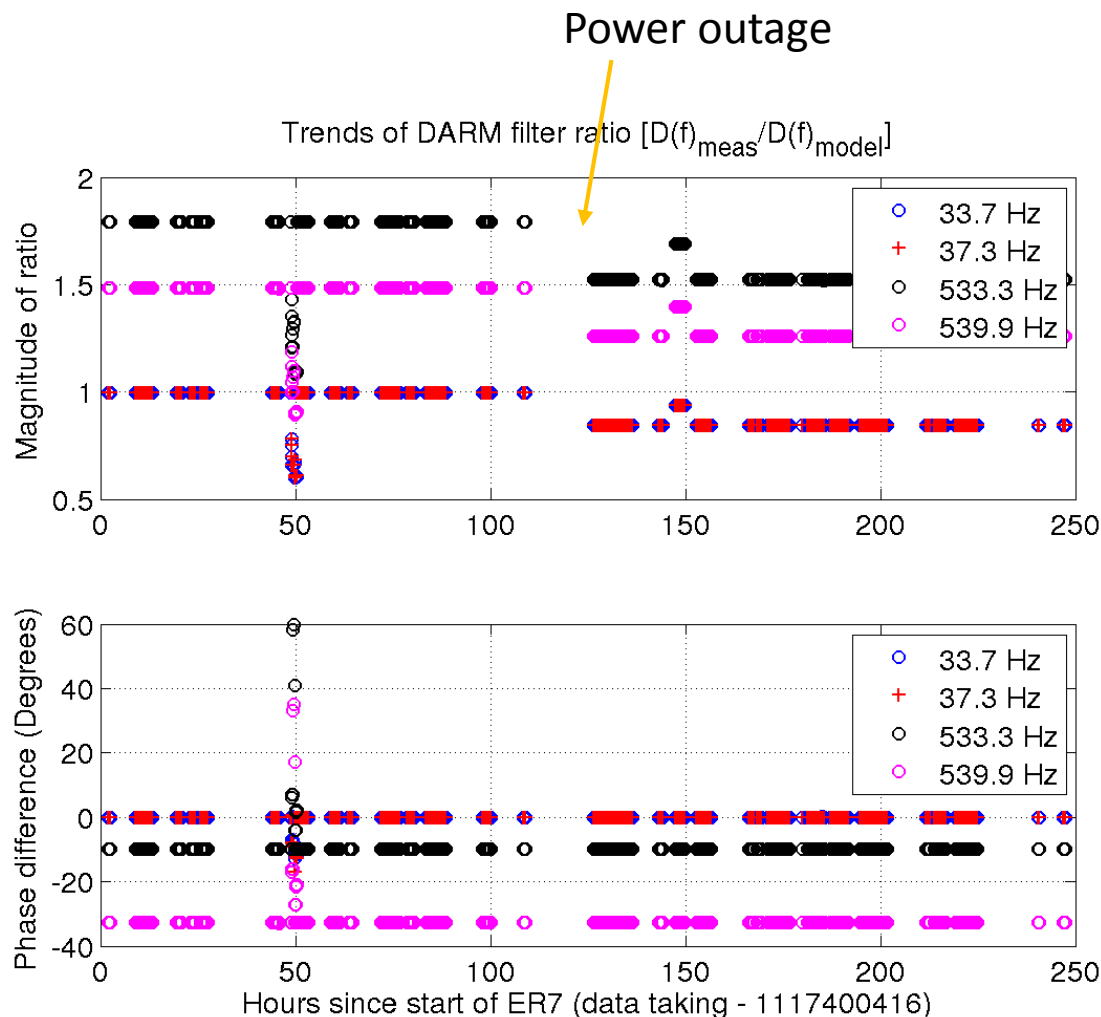
Calibration Lines during ER7

<https://alog.ligo-la.caltech.edu/aLOG/index.php?callRep=18979>

The calibration trend during ER7 (June 5-14)

- DARM filter (D)

$$D(f) = \frac{\text{DARM_ctrl}}{\text{DARM_err}}$$



Calibration Lines during ER7

<https://alog.ligo-la.caltech.edu/aLOG/index.php?callRep=18979>

- Open Loop Gain (G)

~20 % fluctuation

$$G(f) = \frac{X_{\text{ctrl}}}{\text{DARM}_{\text{ctrl}}} - 1$$

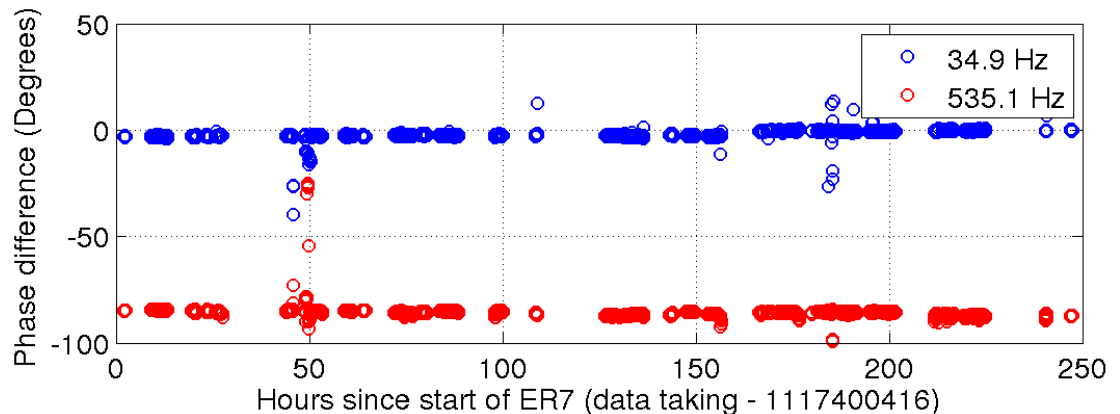
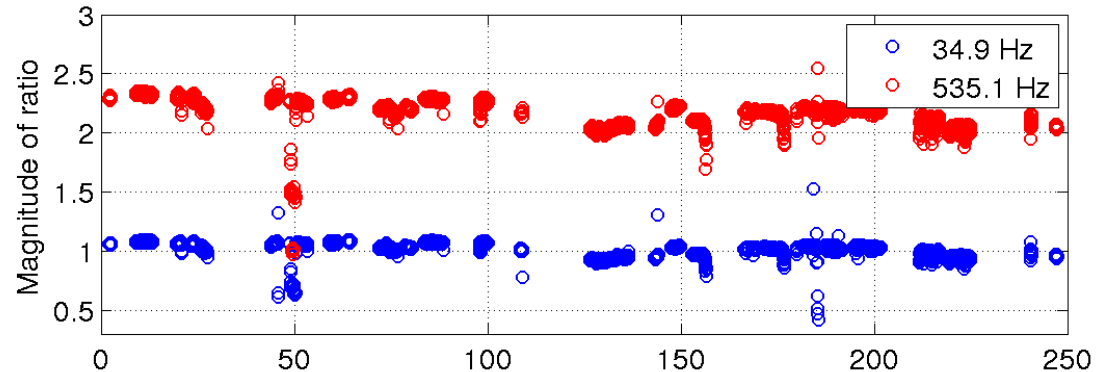
$$G(f) = C(f)A(f)D(f)$$

Sensing function

Actuation function

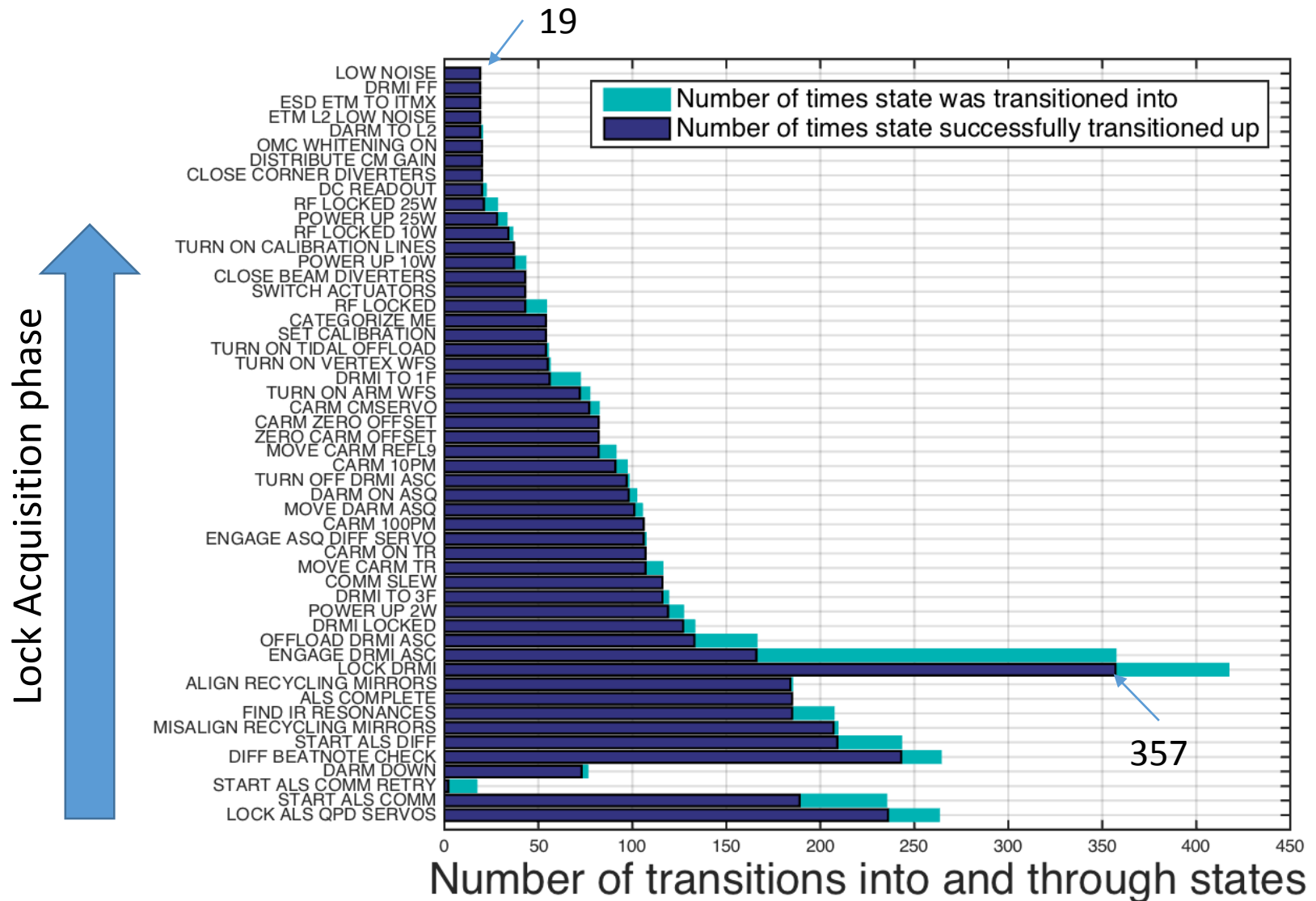
Injected line

Trends of open loop gain ratio $[G(f)_{\text{meas}}/G(f)_{\text{model}}]$



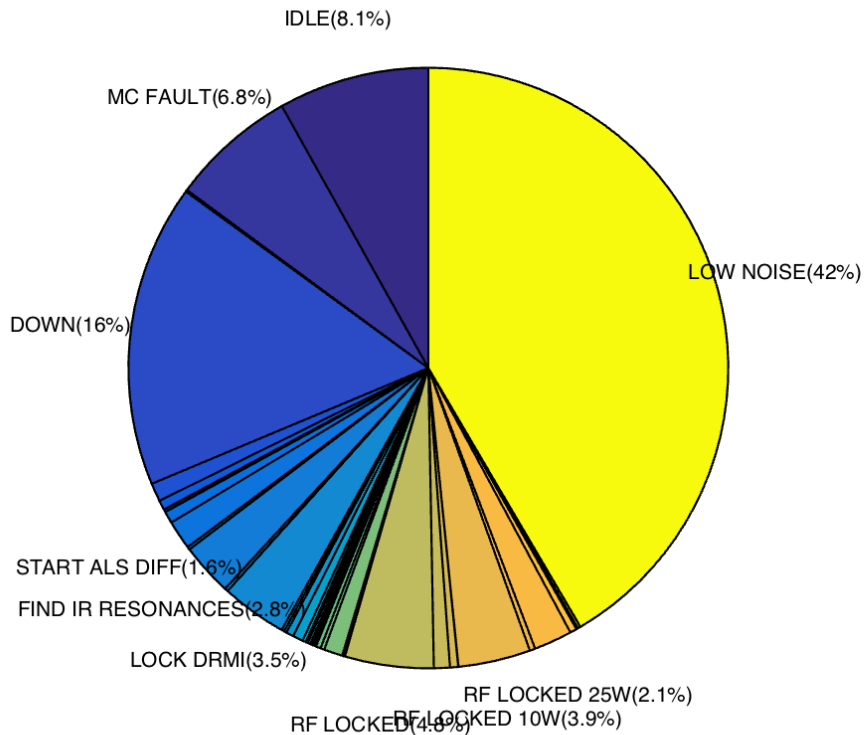
They also checked the consistency of the calibration factor using the sensing function and the actuation function.

Duty Cycle Trends



Guardian state during ER7

**Percent of Time IFO is in Guardian States
June 5 - 14**



**Guardian State Transitions to LOCKLOSS or DOWN
June 5 - 14**

