

Determining H1's "BEST" Range in O2

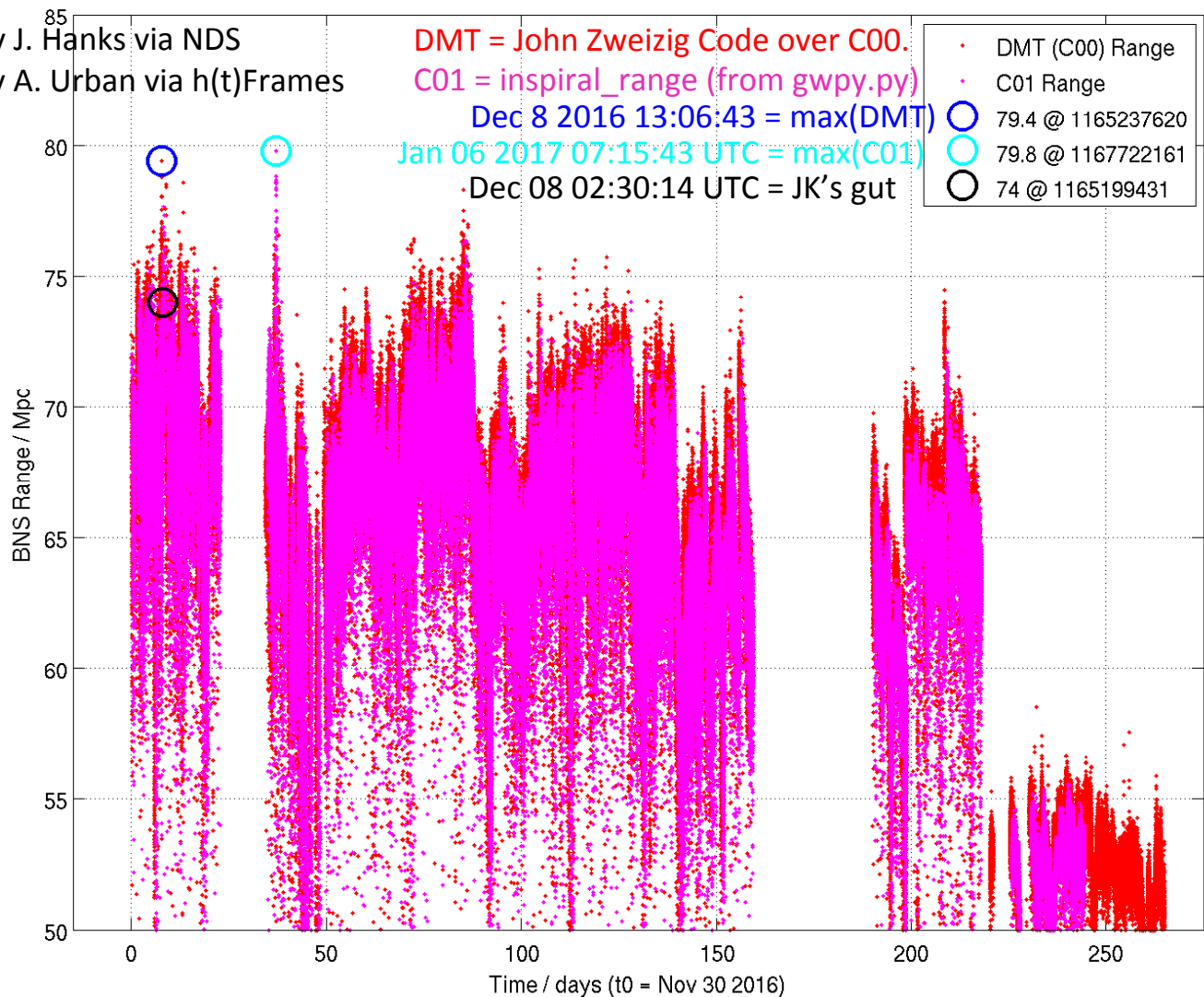
J. Kissel, for the Calibration Team

“All” of O2 BNS Range, DMT vs C01

O2 Performance To Date, H1

Gathered by J. Hanks via NDS

Gathered by A. Urban via h(t)Frames

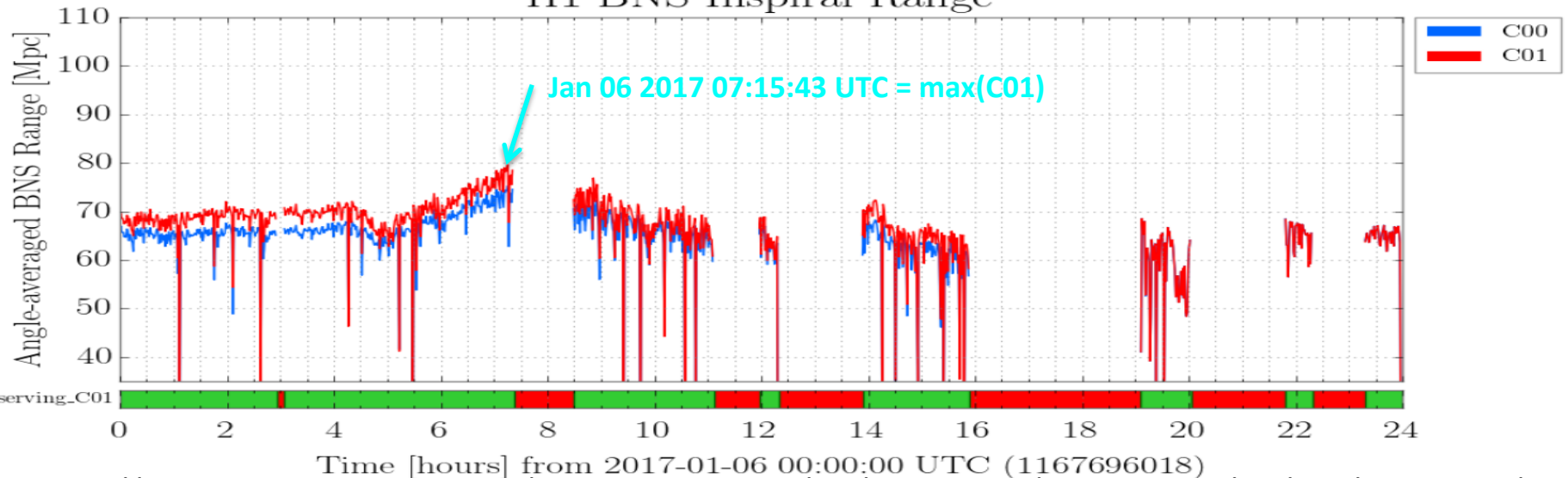


Note – C01 data only up to Aug 1 2017 was available at the time of this “best” time assessment. We assume range has not gotten substantially better (more than 1 sigma of Calibration Uncertainty) in the remainder of the run. And sadly, we know that H1 has its best range at the beginning of the run.

Both DMT and C01 Max are at Beginning or Ends of Strange Locks

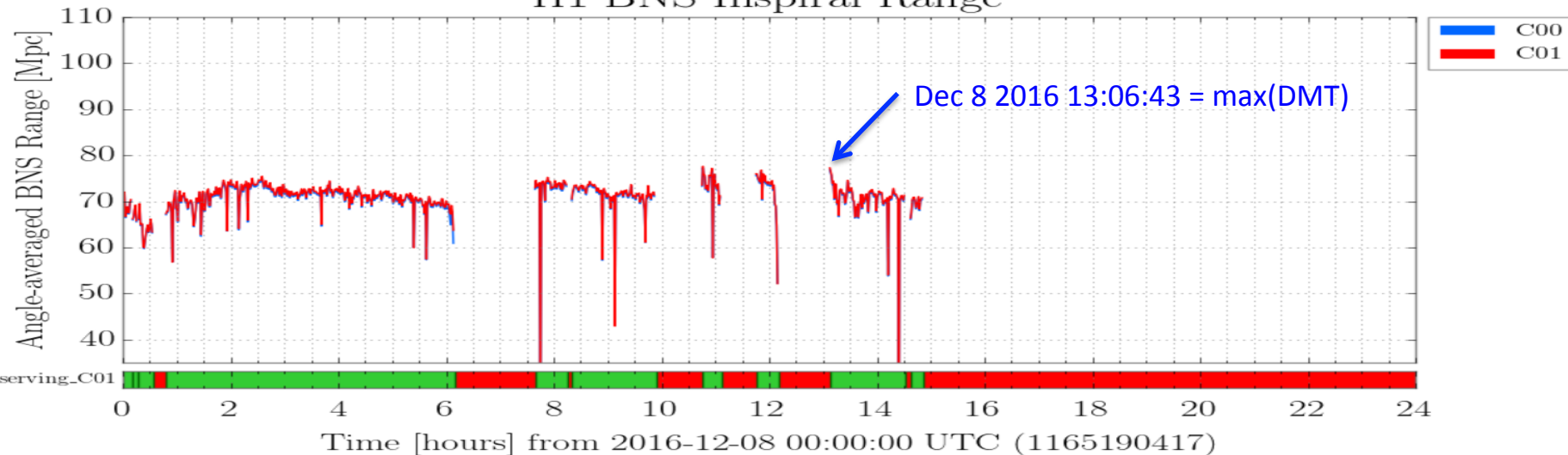
https://ldas-jobs.ligo.caltech.edu/~alexander.urban/O2/calibration/C00_vs_C01/H1/day/20170106/

H1 BNS Inspiral Range

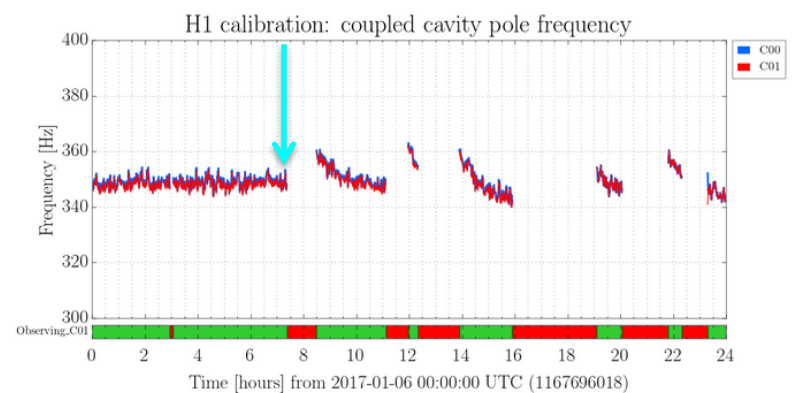
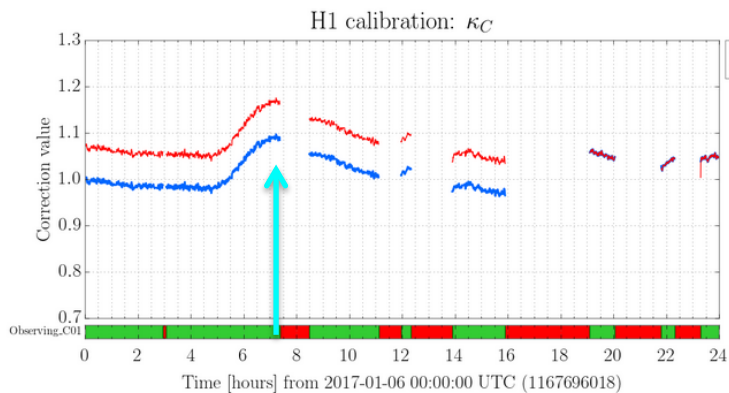
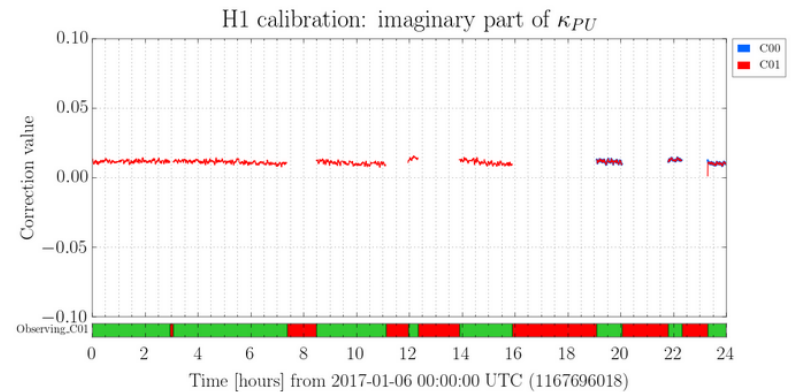
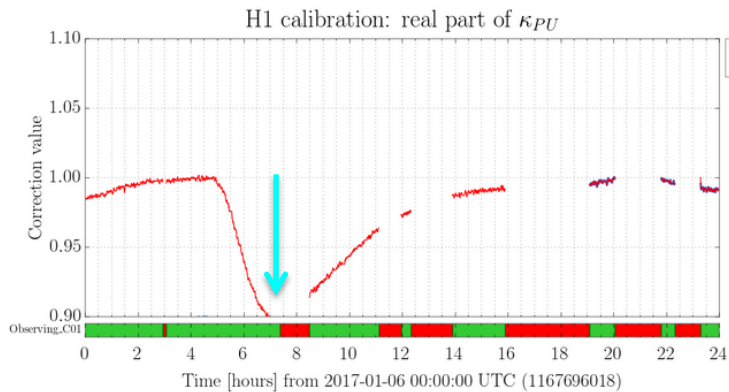
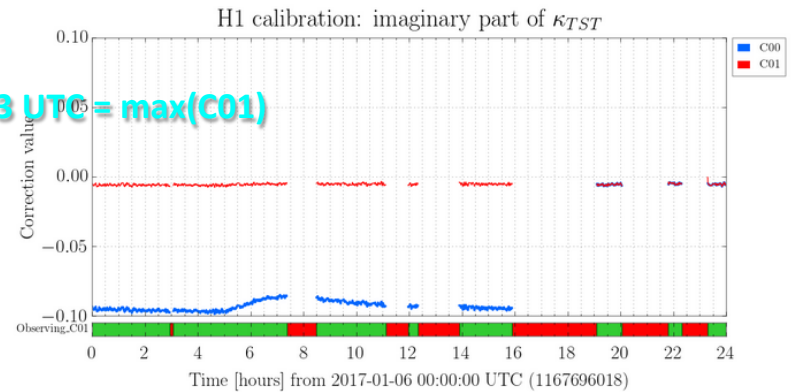
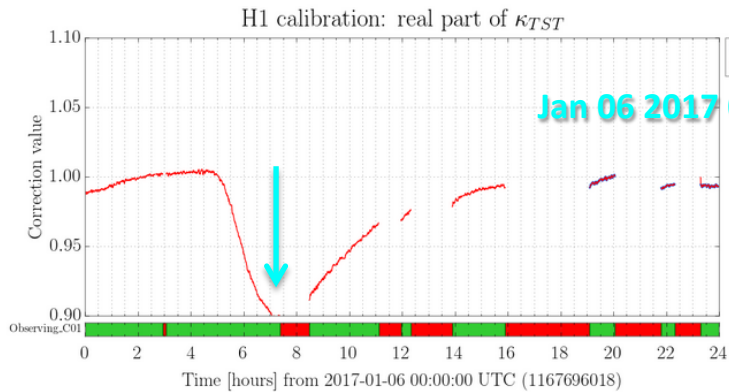


https://ldas-jobs.ligo.caltech.edu/~alexander.urban/O2/calibration/C00_vs_C01/H1/day/20161208/

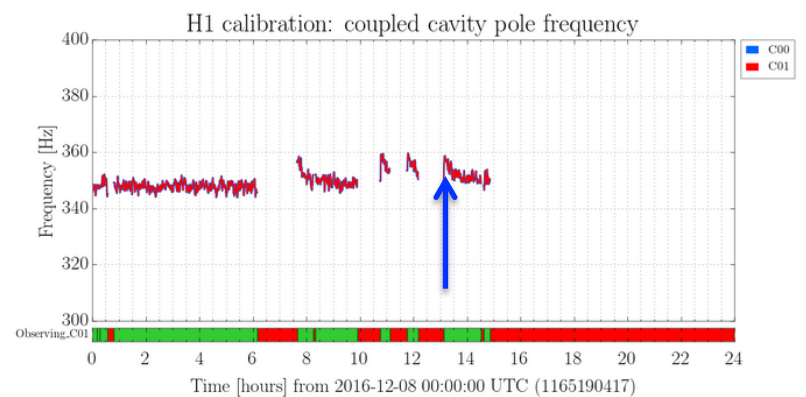
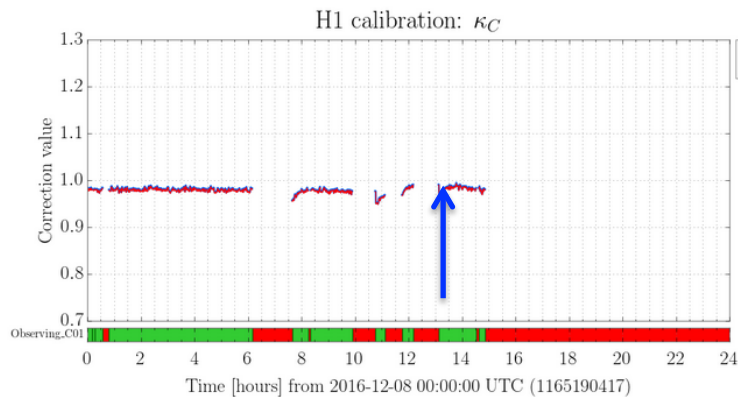
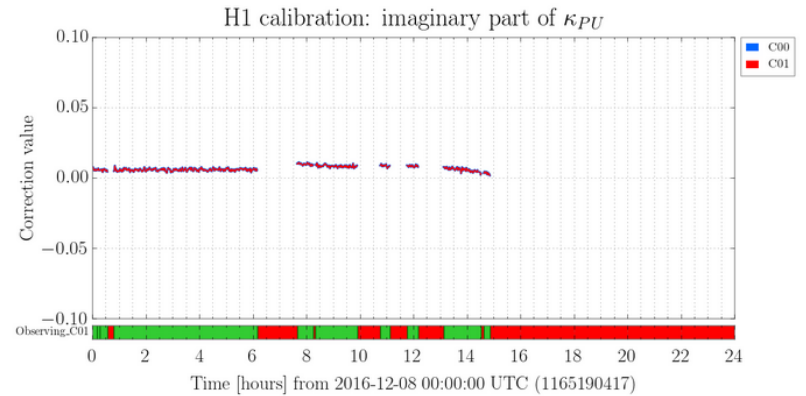
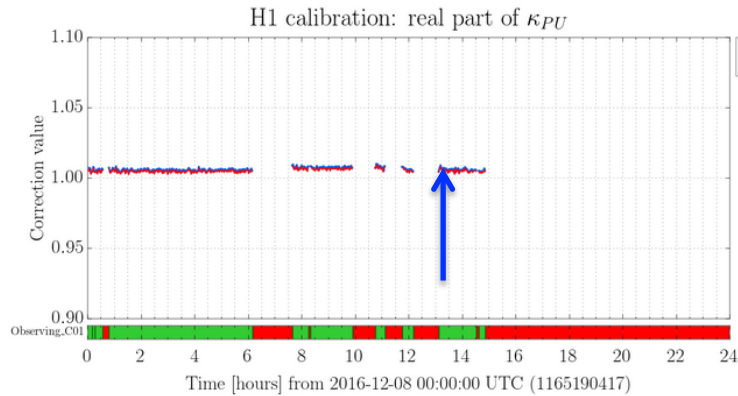
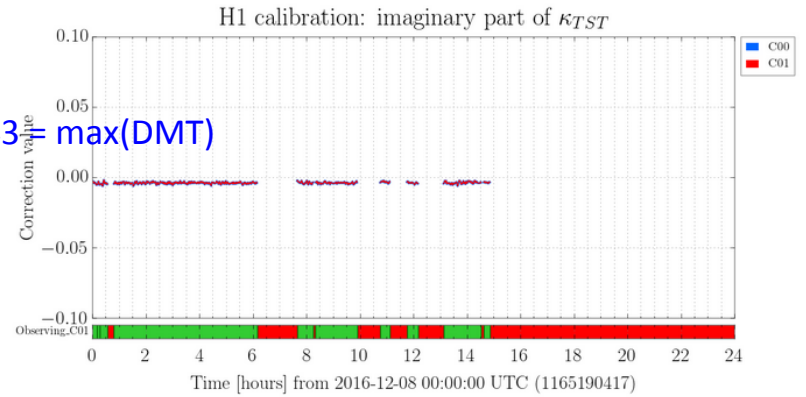
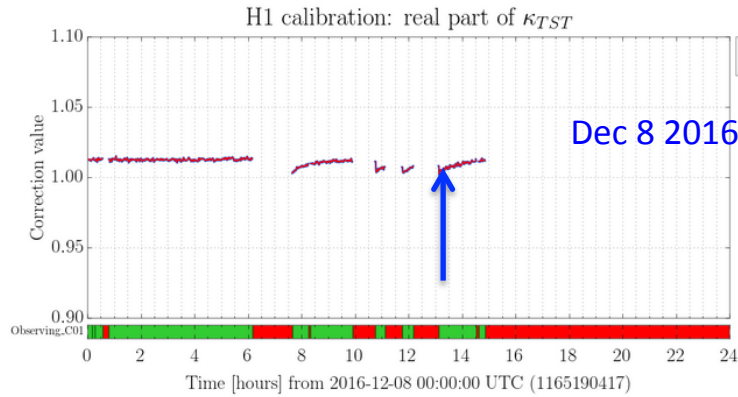
H1 BNS Inspiral Range



Both DMT and C01 Max are at Beginning or Ends of Strange Locks

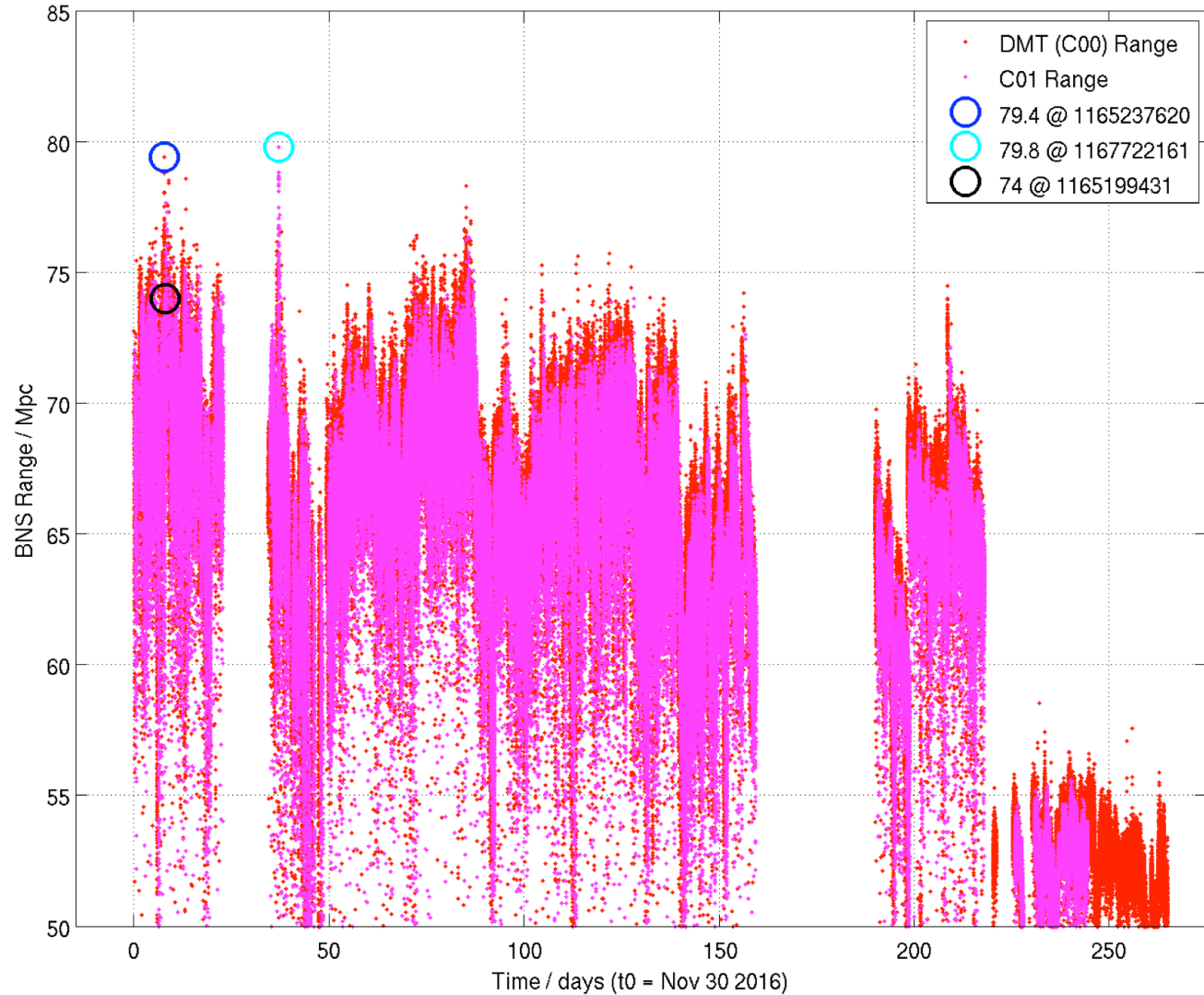


Both **DMT** and **C01** Max are at Beginning or Ends of Strange Locks



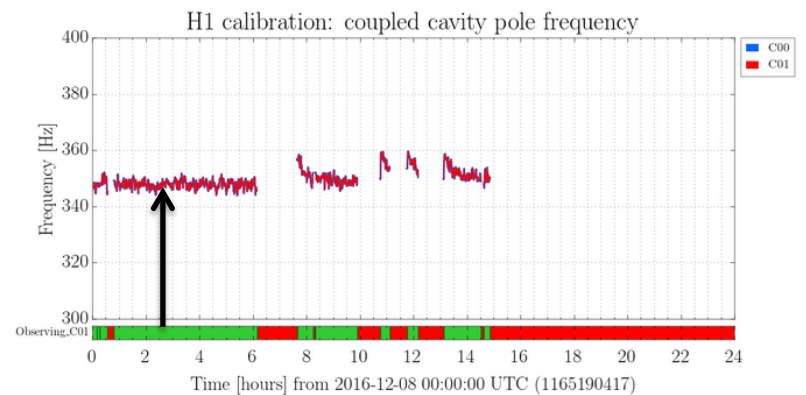
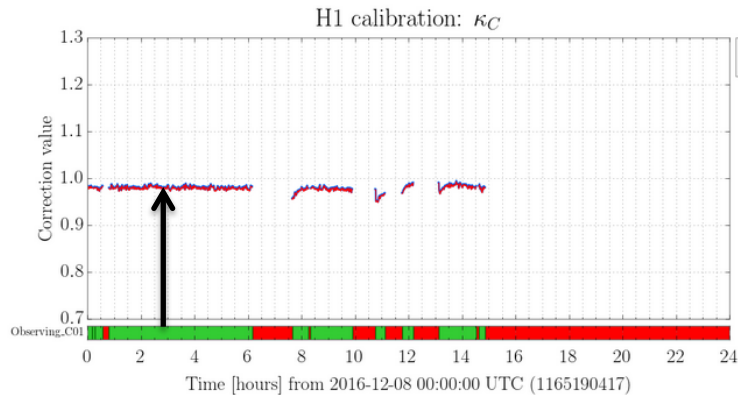
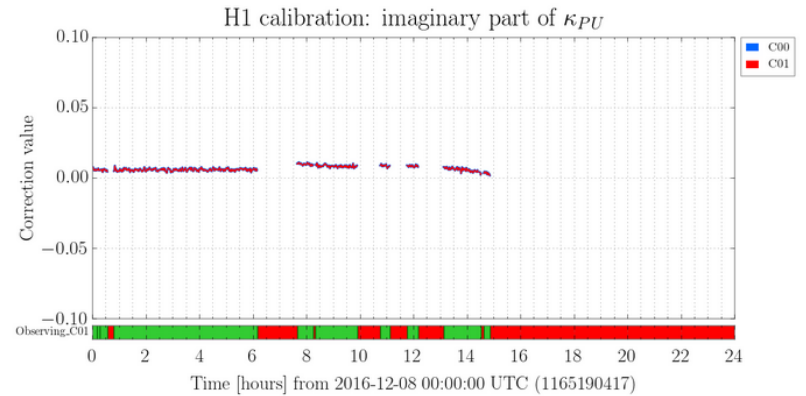
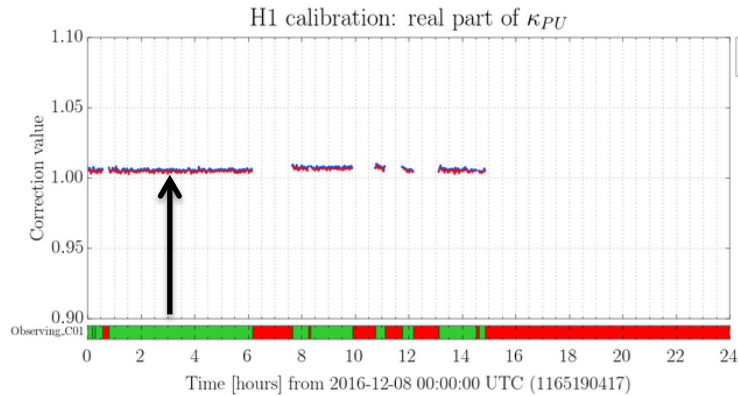
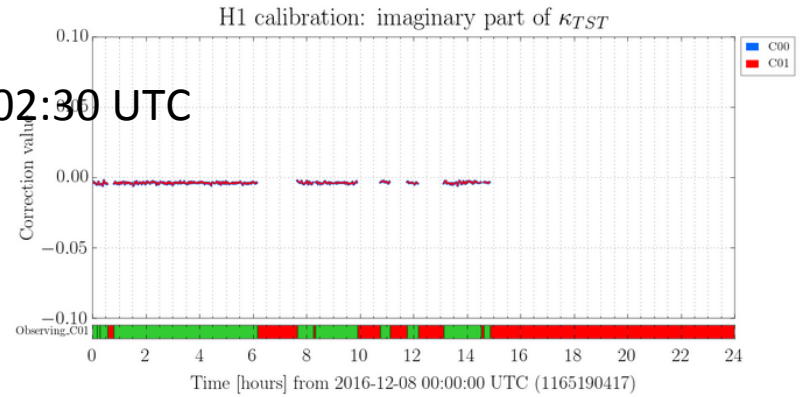
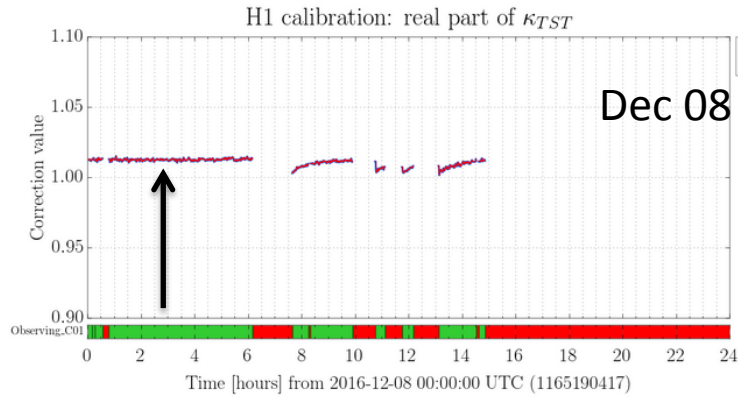
So Chose Highest Range in C01 with Stable Lock: Dec 08 2016 02:30 UTC

O2 Performance To Date, H1



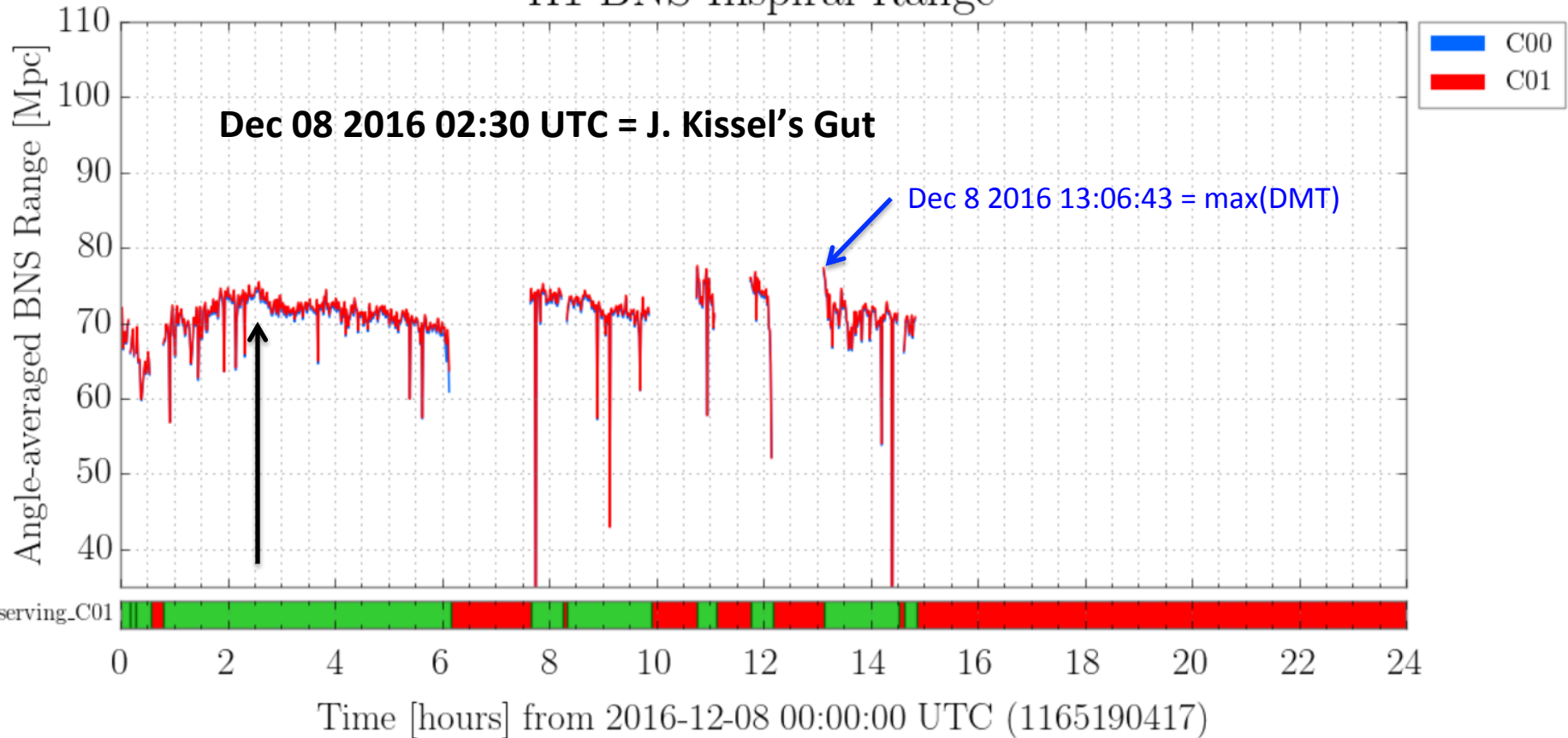
created by findstrange_O2 on 24-Aug-2017

Nice, High-ish Range, Stable, 1.5 hrs into Lock



Dec 08 2017

H1 BNS Inspiral Range

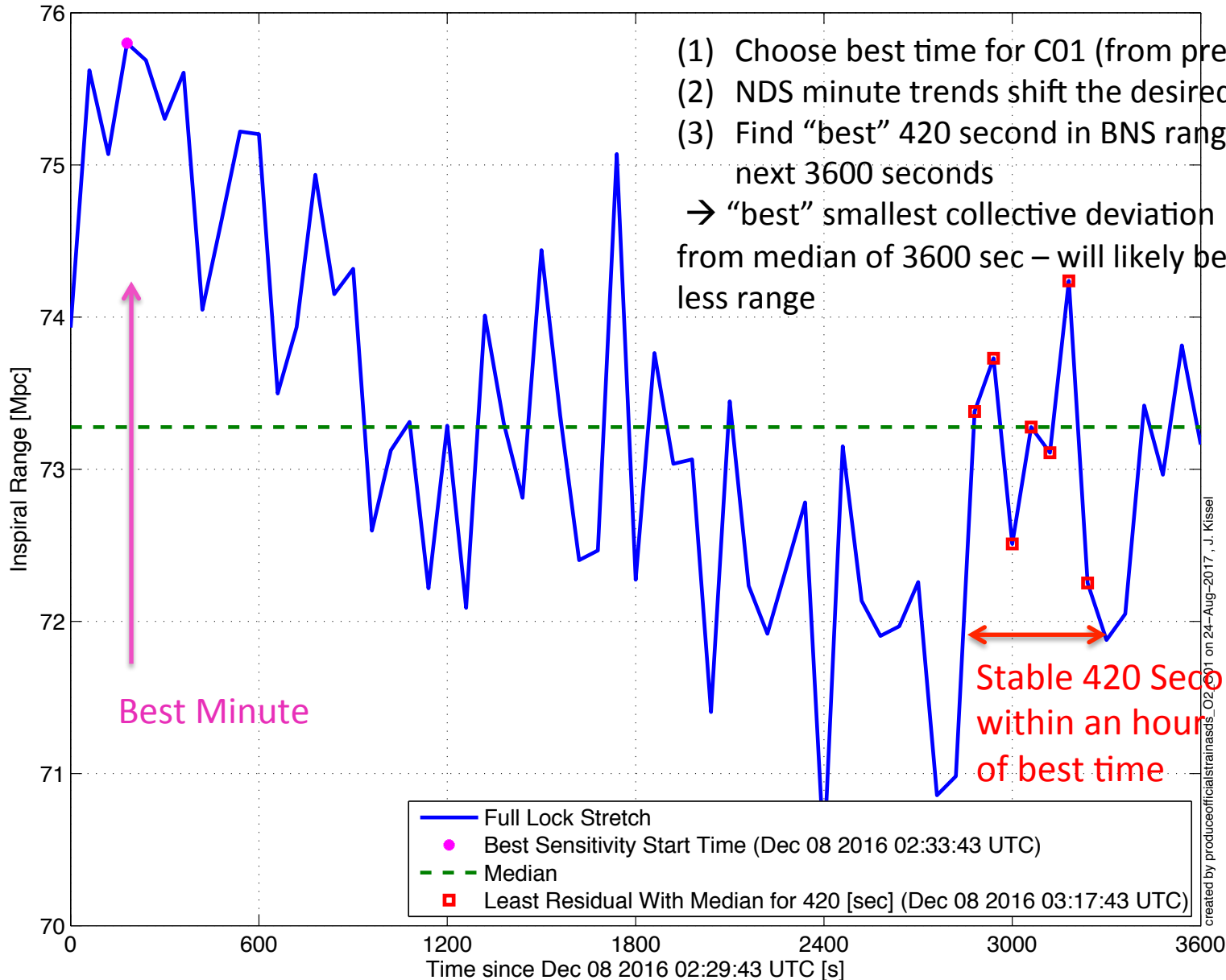


Why is C00 different from Slide 6? → Summary Pages compute C00 and C01 range with gwpy.py inspiral_range, where as DMT is computed by some Zweizig code.

https://ldas-jobs.ligo.caltech.edu/~alexander.urban/O2/calibration/C00_vs_C01/H1/day/20161208/

2016-12-08 Time of ASD Choice

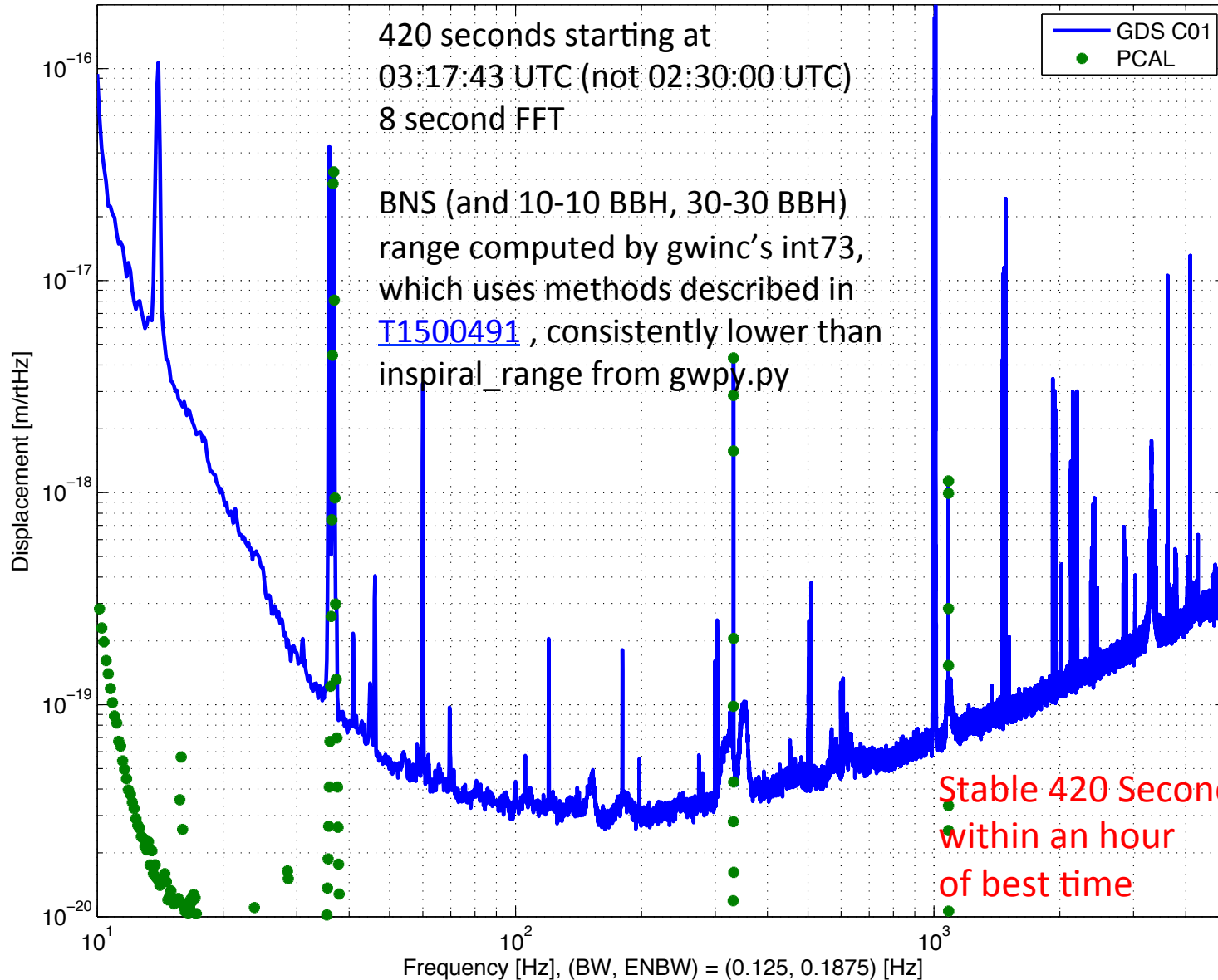
H1:DMT-SNSH_EFFECTIVE_RANGE_MPC.mean,m-trend



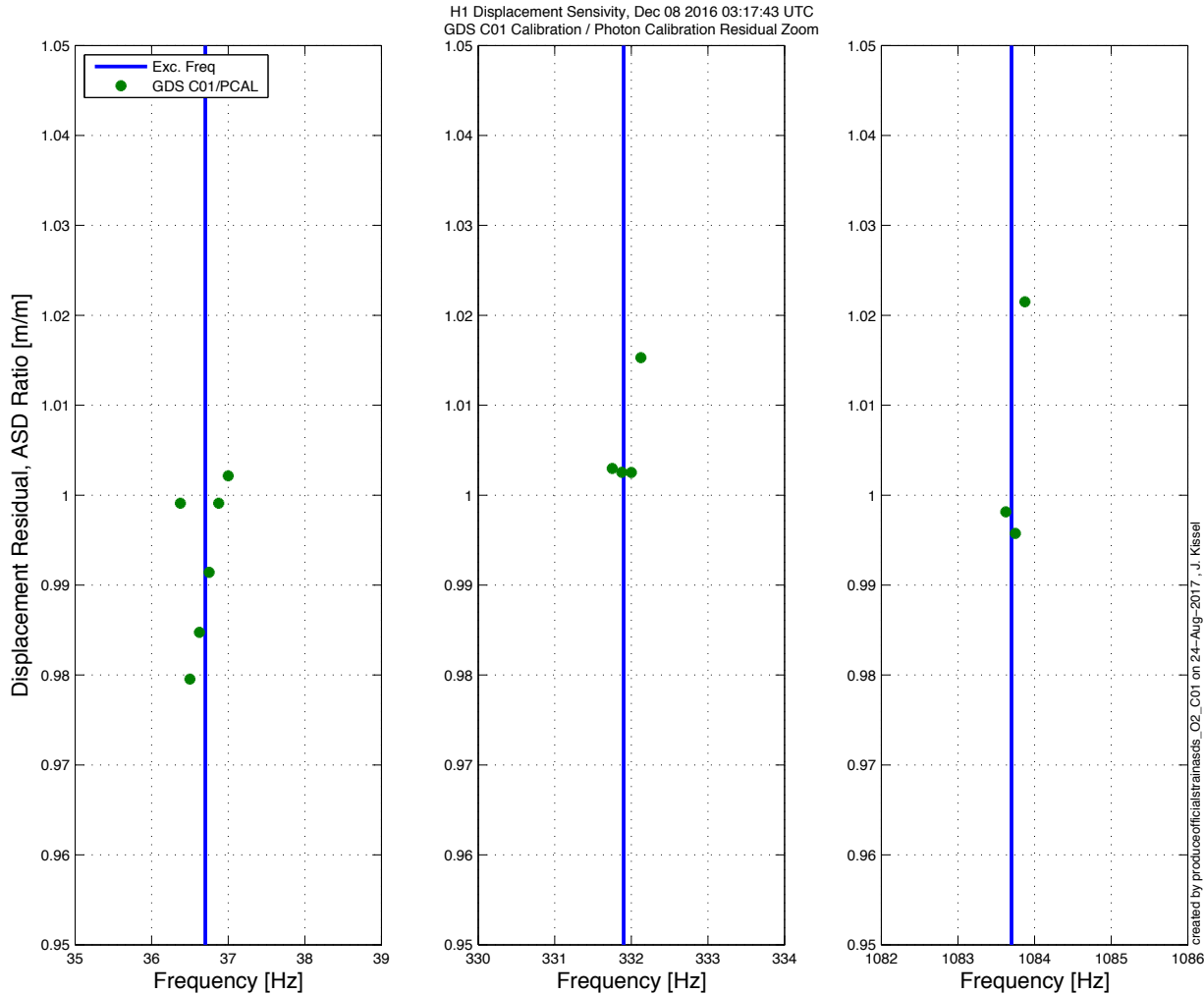
created by produceofficialstrainasds_02 C01 on 24-Aug-2017, J. Kissel

Compute 100 avg ASD of C01 h(t)

H1 Displacement Sensivity, Dec 08 2016 03:17:43 UTC
Input Power 29.4 [W], $D_{\text{SenseMon}}(1.4/1.4, 10/10, 30/30 [M_{\text{sol}}]) = (70.61, 350, 867.4) [\text{Mpc}]$



See Full Detailed Plots



C01 h(t) [m] / PCALY RXPD [m]

Within 1% at All CAL Line
Frequencies
*Consistent with Uncertainty &
Error Estimate* [P1600139](#)

- plots produced by standard script:

```
/ligo/svncommon/CalSVN/aligocalibration/trunk/Runs/02/Common/  
Scripts/DARMASDs/produceofficialstrainasds_02_C01.m
```

Performance “Improvement”

