

One Arm Test - SEI Status

Before the beginning of the OAT:

- **12 Feedback Loops on ISI in BSC-8**
 - **0.75 Hz CPS/L4C Blend**
 - **15 Hz Unity Gain Frequency**
 - **Gain peaking of 2 per stage near blend frequency**
 - **Overall gain peaking was ~ 4 in the suspension modes frequency band**

- **12 Damping Loops on ISI in BSC-6**

- **8 Feedback loops on HEPI at both ends**
 - **~ 1 Hz CPS/L4C Blend**
 - **10 Hz Unity Gain Frequency**
 - **Gain peaking of 2 near blend frequency**

- **Were working on HEPI sensor correction at the beginning of the OAT**

One Arm Test - SEI Status

Since the beginning of the OAT:

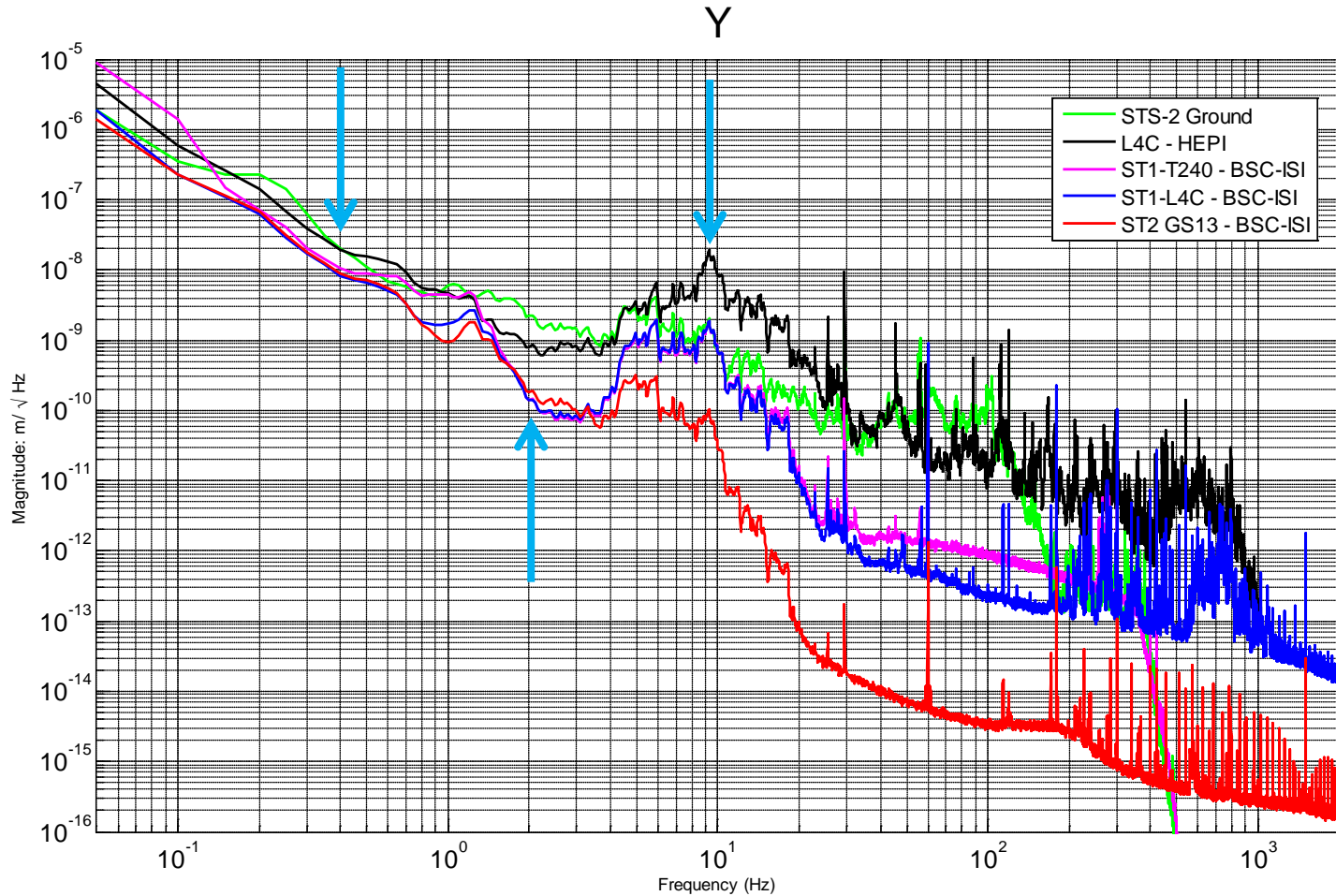
- **Focused on the two BSC-ISI to improve the performance in the suspension modes frequency band (Especially the modes at .45 Hz and 1 Hz)**

- **Implemented the feedback loop on ISI in BSC-6**
 - **Same characteristics as in BSC**
 - **Difficulties with Stage 1 RZ**

- **Back to the ISI in BSC-8**
 - **New High Blends to minimize gain peaking**
 - **Installed in 12 degrees of freedoms**
 - **New low blend to provide performance specifically in the suspension modes frequency band**

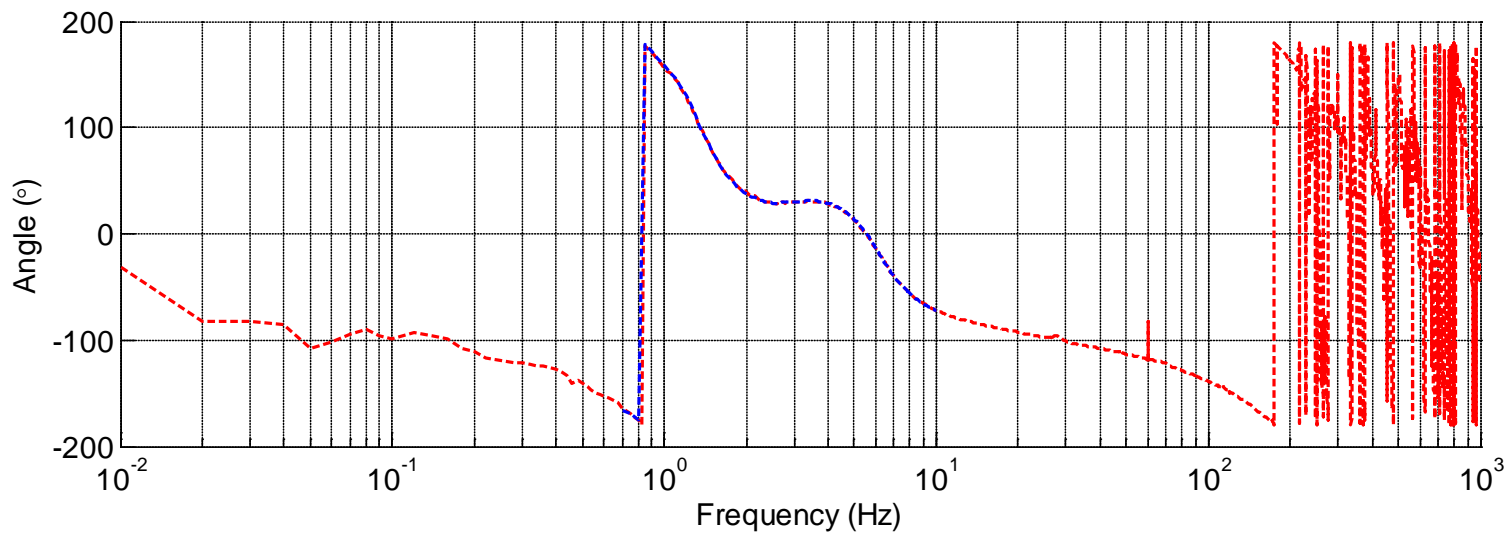
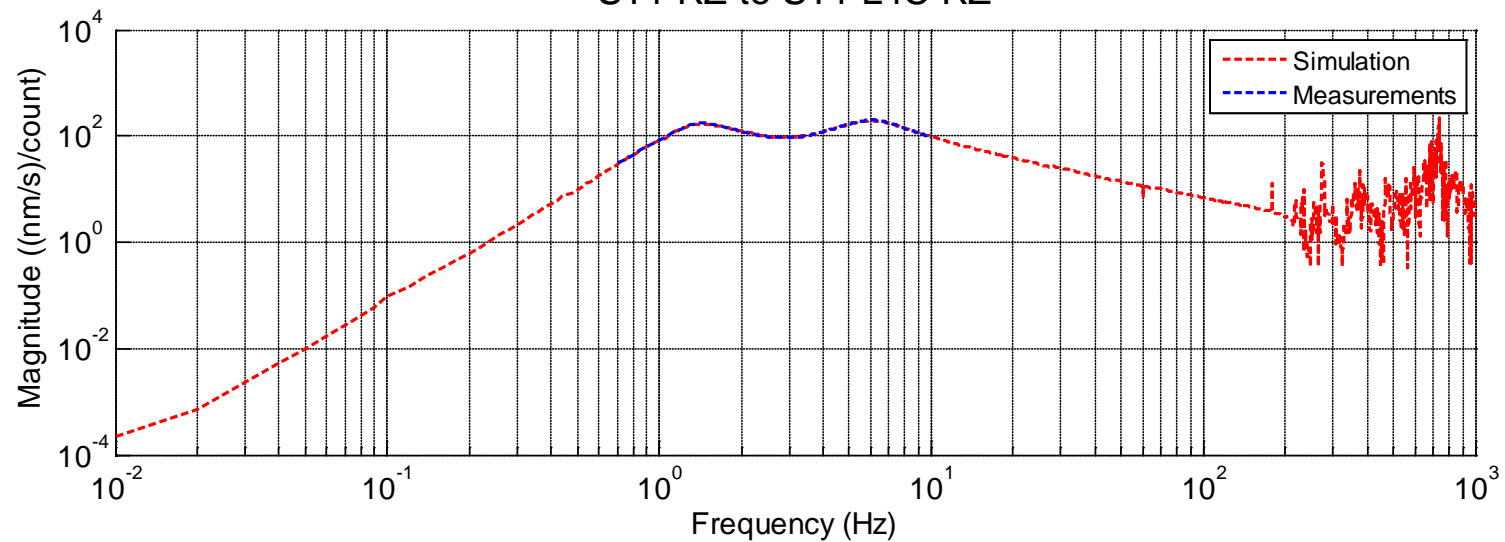
Ground and Platform Motion – ETMY

LHO BSC6 - Damped - HEPI controlled - No sensor correction



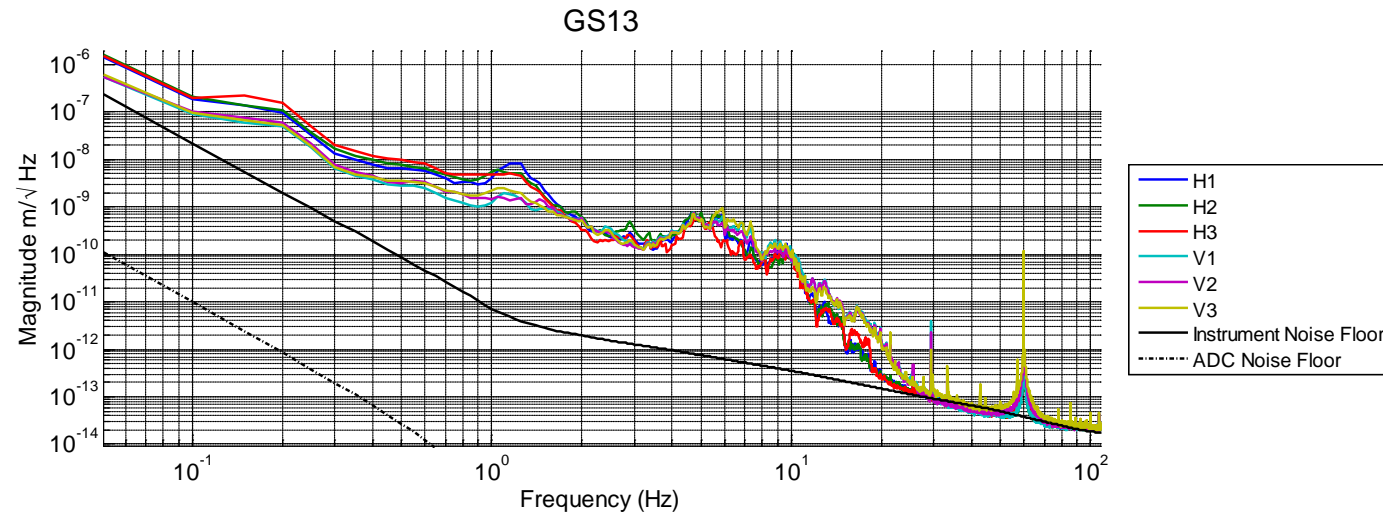
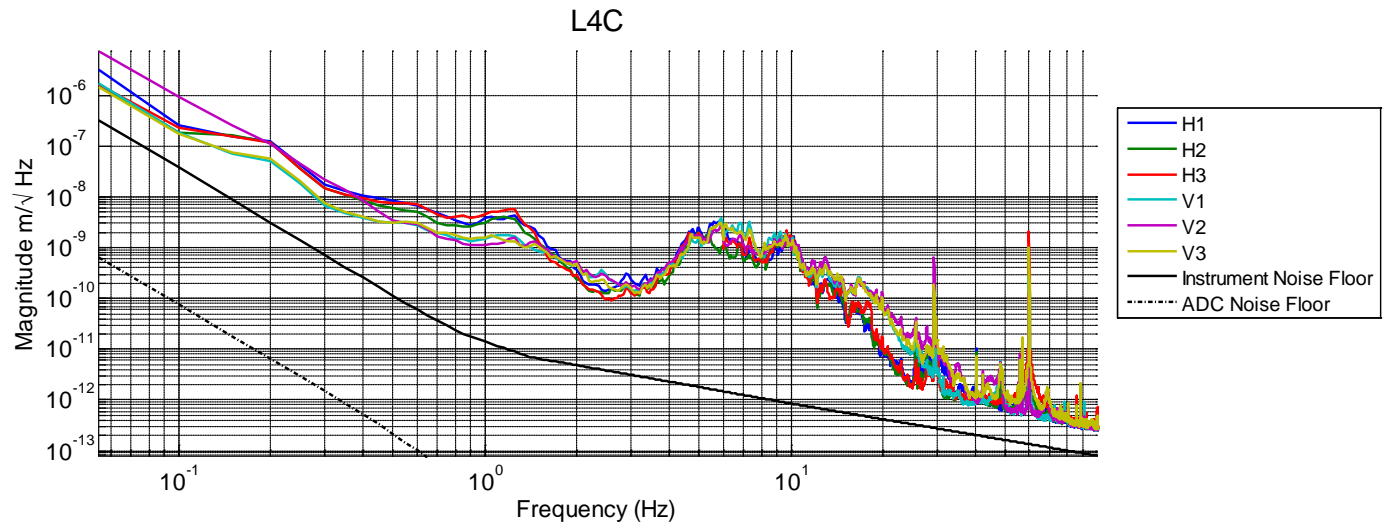
Measurement length: 610s - Sample window: 20s - Overlap: 50% -

ST1 RZ to ST1 L4C RZ



Sensors Noise – ETMY

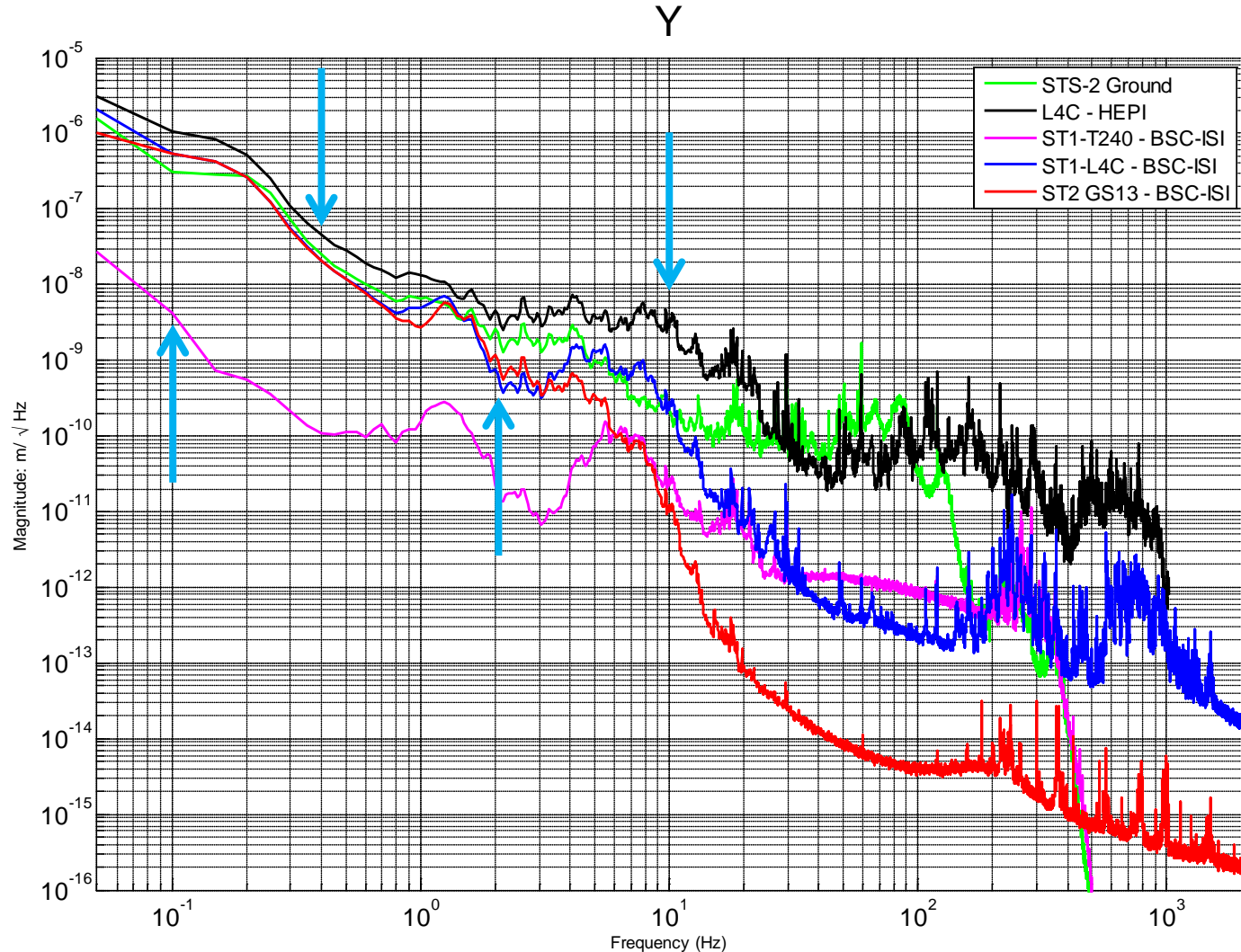
LHO BSC-ISI - BSC6 - July 15, 2012 - In Vacuum - Damped - ETMY Damped - TMS damped



Measurement length: 1010s - Sample window: 20s - Overlap: 50%
Frequency resolution: 50mHz - Averages: 100 - Measurement start (GPS): 1026472237

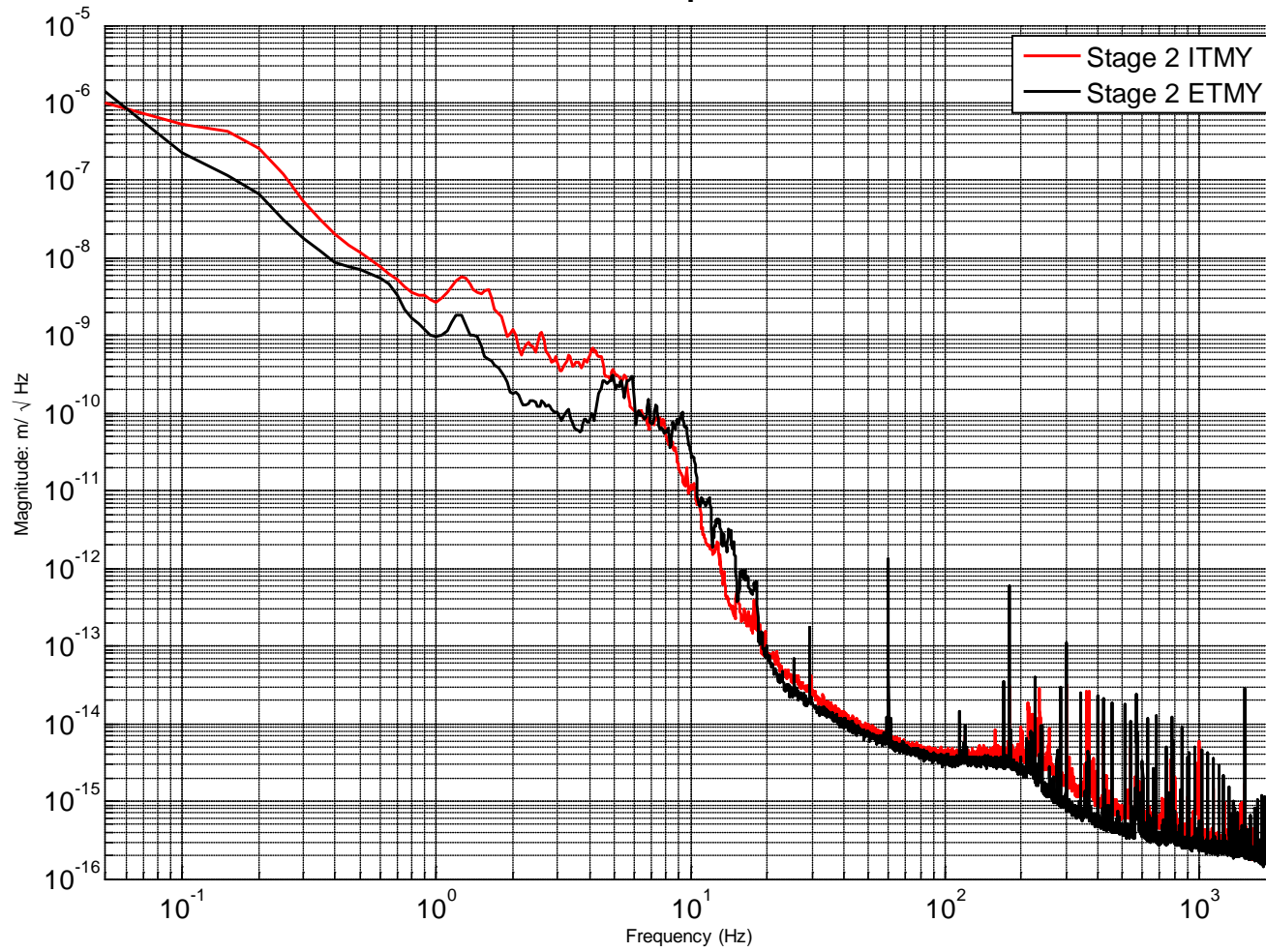
Ground and Platform Motion – ITMY

LHO BSC8 - Damped - HEPI controlled - No sensor correction

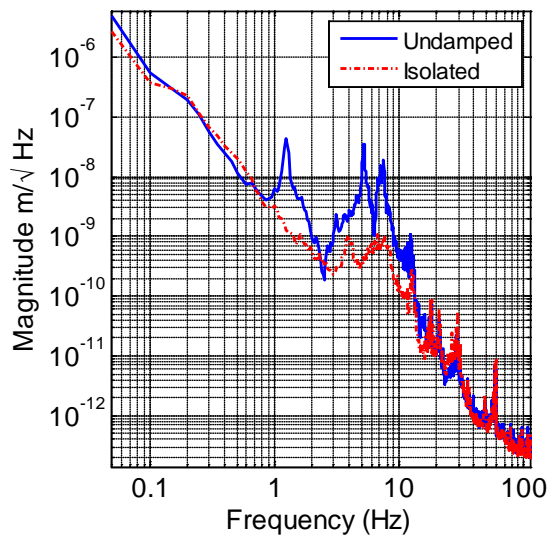


Measurement length: 610s - Sample window: 20s - Overlap: 50% -

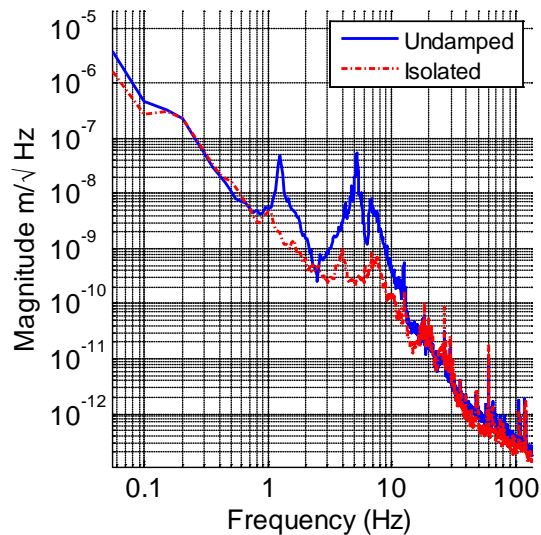
Stage 2 Motion Y



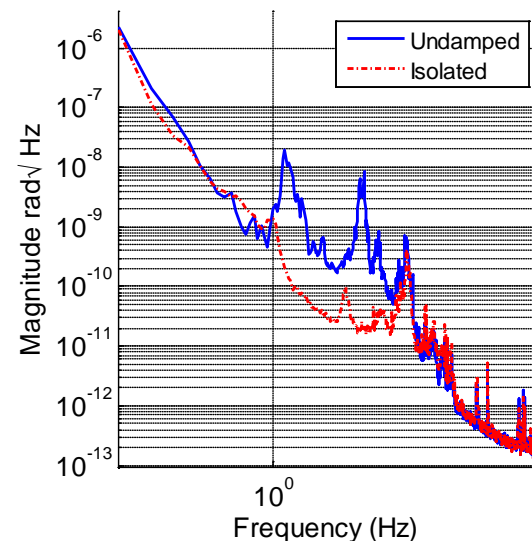
ST1 L4C - X



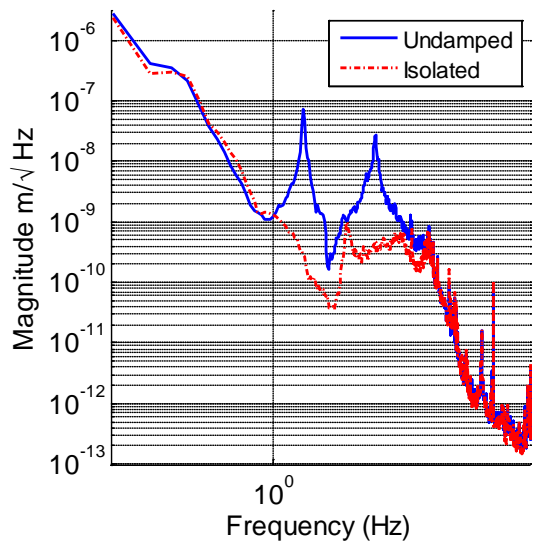
ST1 L4C - Y



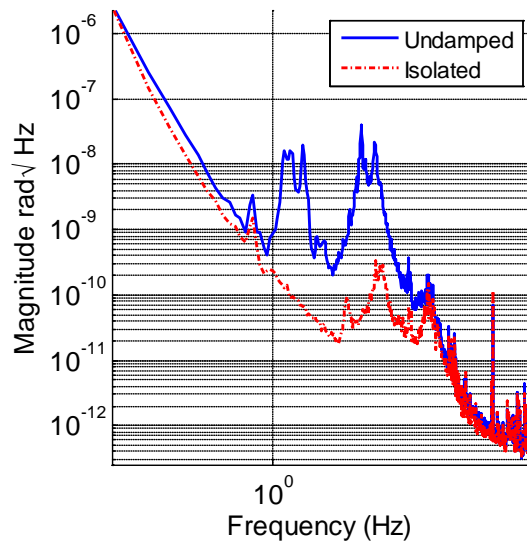
ST1 L4C - RZ



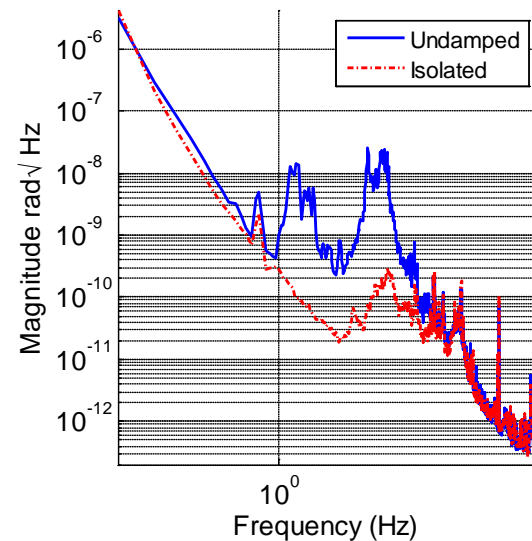
ST1 L4C - Z



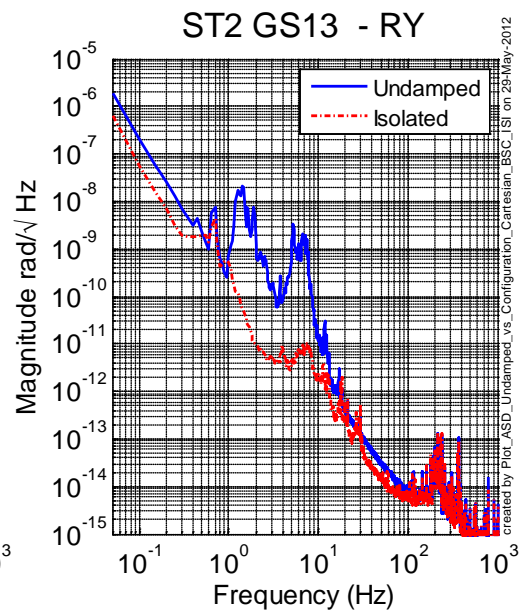
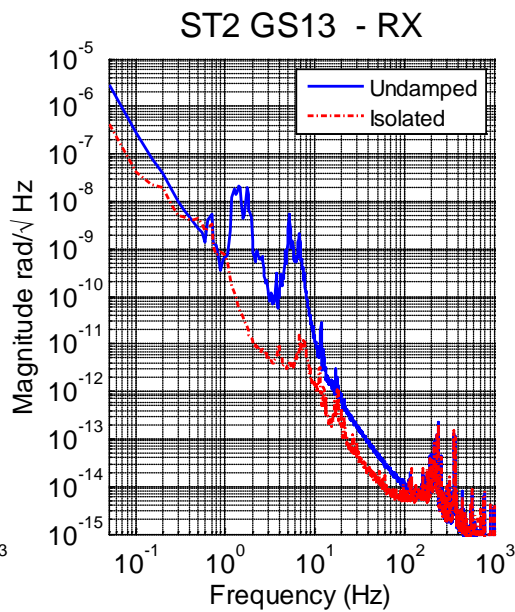
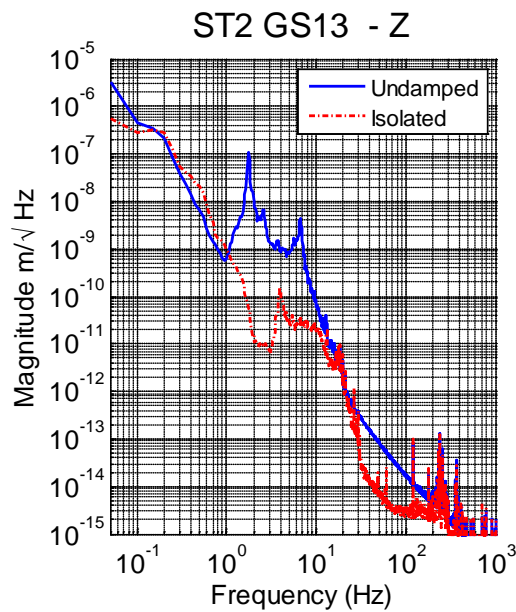
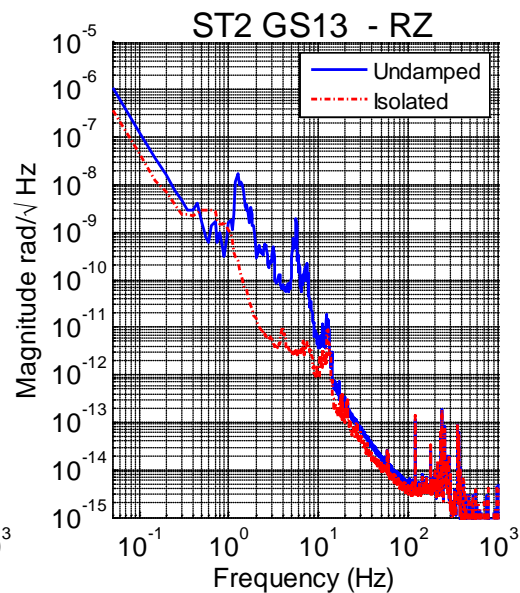
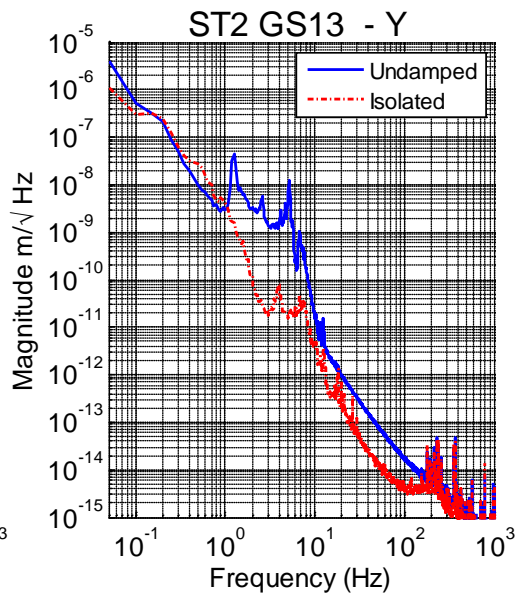
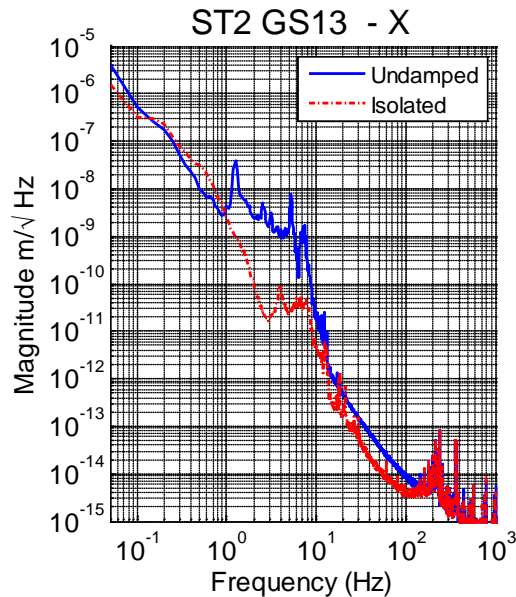
ST1 L4C - RX



ST1 L4C - RY



New High Blend => no more gain peaking (In loop Sensor)

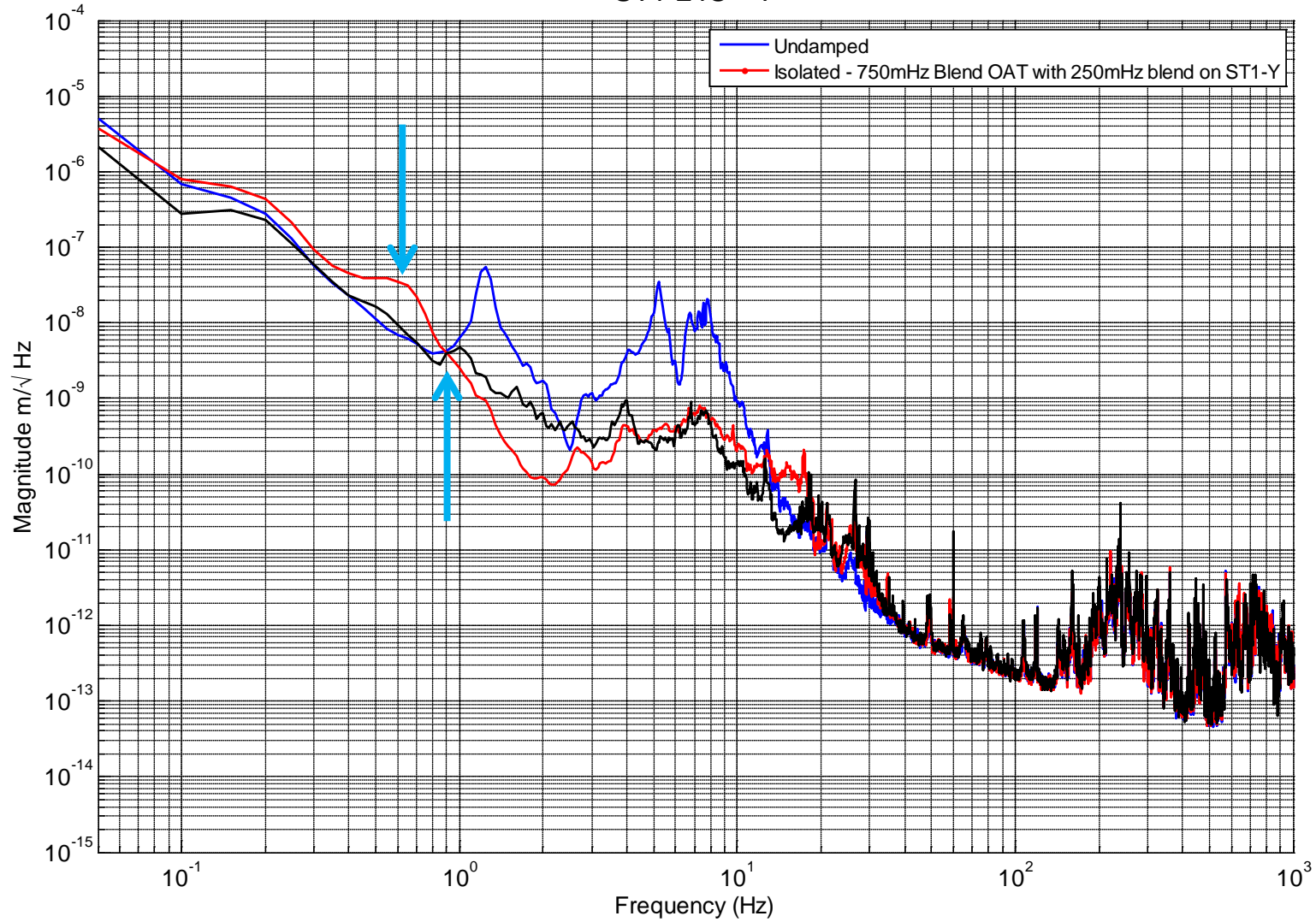


created by Plot_ASD_Undamped_vs_Configuration_Cartesian_BSC_ISI on 29-May-2012

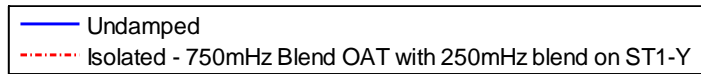
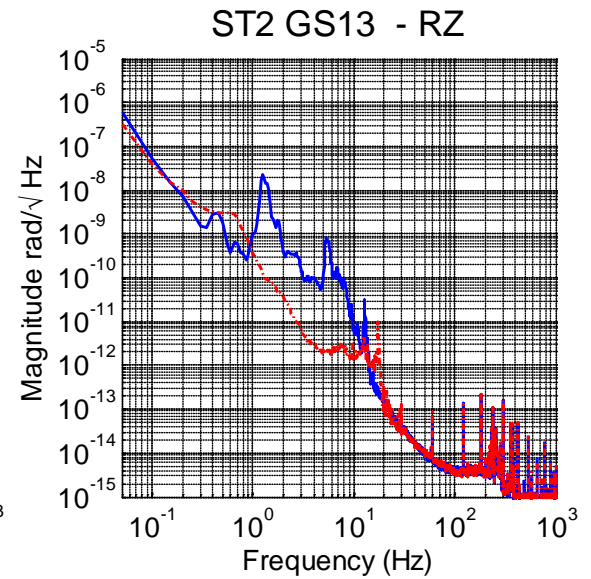
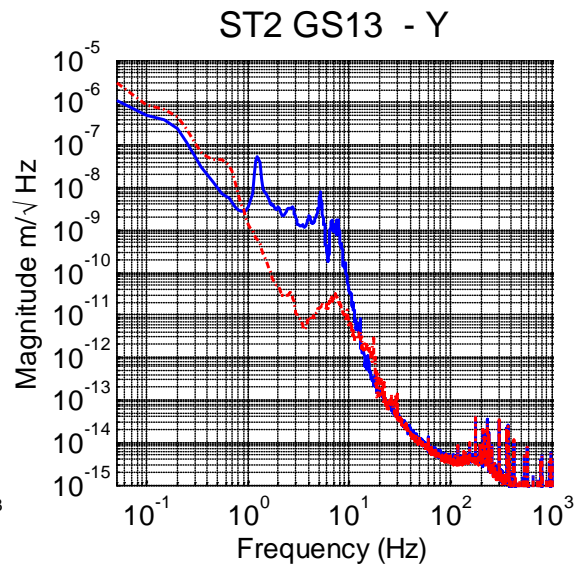
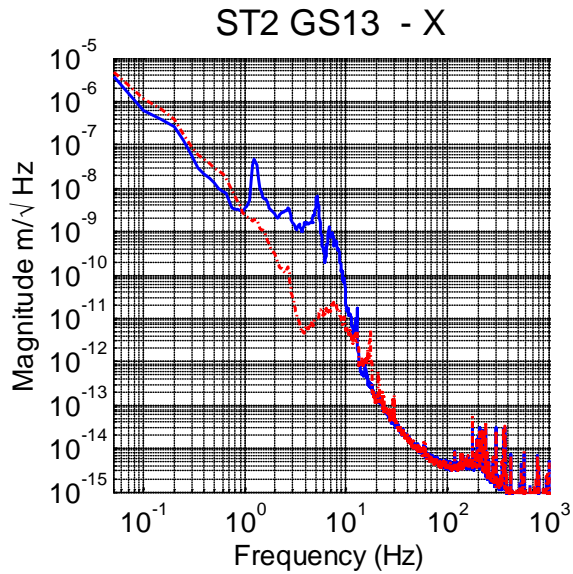
New High Blend => no more gain peaking (Witness Sensor)

LHO ISI-BSC8 - July 17, 2012 - In the chamber - Vacuum - ISI Controlled with 750mHz OAT blend - Test - Damped SUS-ITMY and SUS-FMY

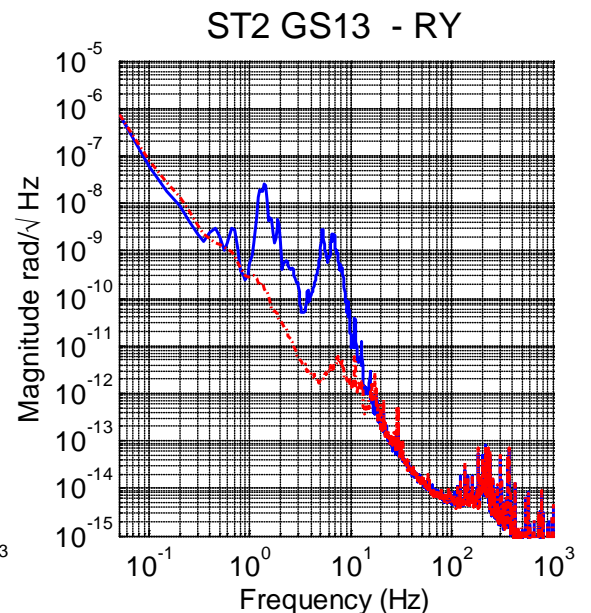
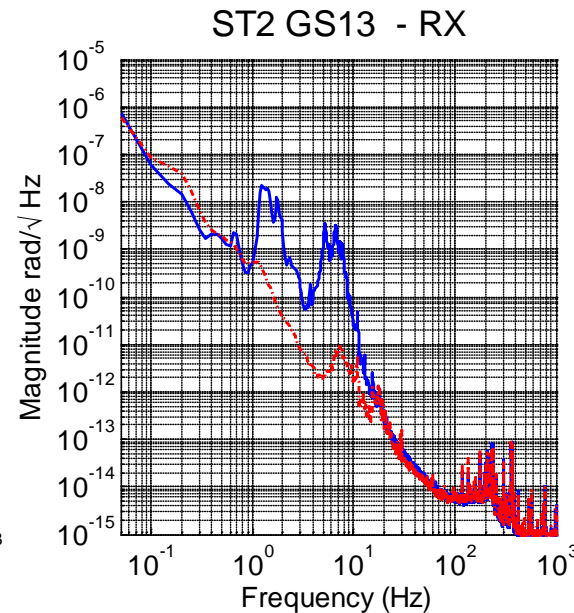
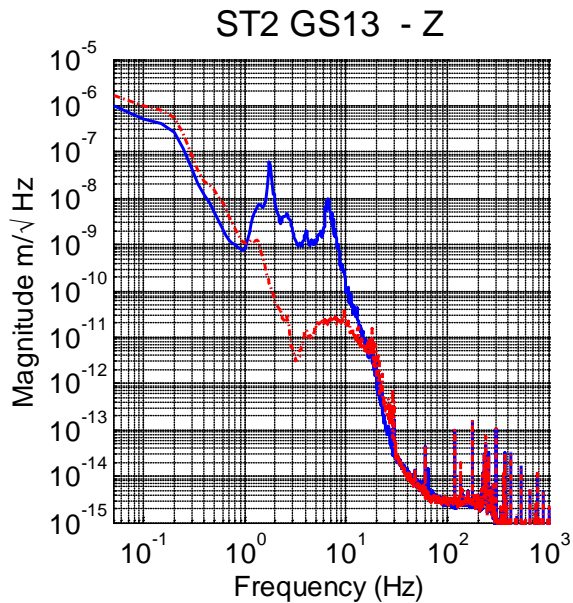
ST1 L4C - Y



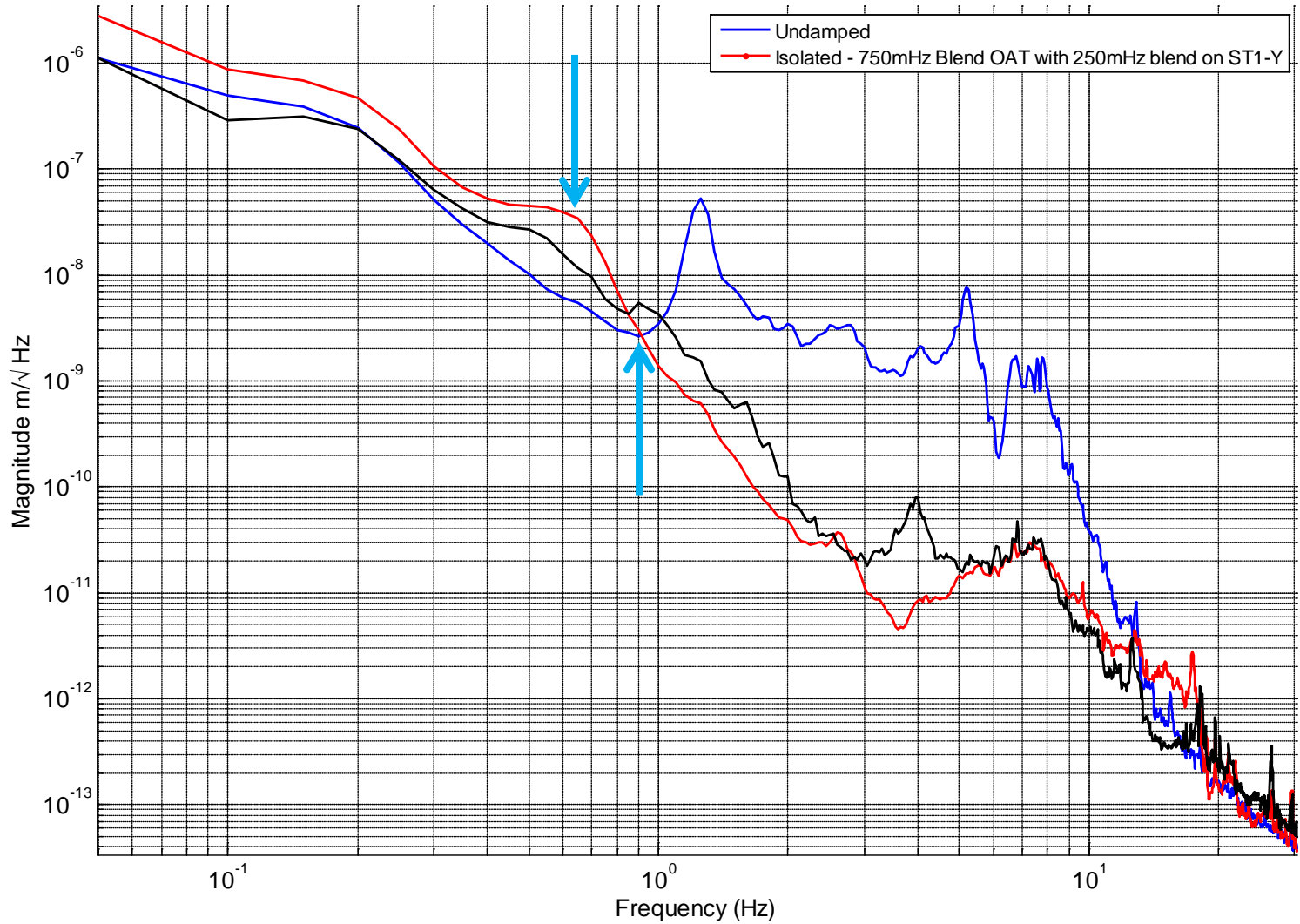
Longitudinal Low Blend (In Loop Sensor)



Longitudinal Low Blend (Witness Sensor)



LHO ISI-BSC8 - July 17, 2012 - In the chamber - Vacuum - ISI Controlled with 750mHz OAT blend -
Test - Damped SUS-ITMY and SUS-FMY
ST2 GS13 - Y



Longitudinal Low Blend (Witness Sensor)

Our Plan from there:

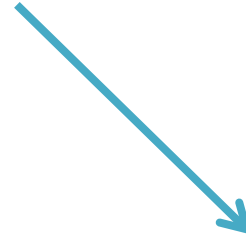
- **Get the low blend performance on ITMY Longitudinal with Stage 1**
 - Use Stage 2 as our performance witness
 - Analysis the performance of the low blend installed yesterday
 - Insert the T240 in the blend
 - Use blend with “notches” at 0.45 Hz and 1 Hz
- **Duplicate the work at ETMY**
- **Use the cavity as witness and decide what the next priority**



**More Isolation in
Longitudinal => Stage
2 Low blend**



**Low Blend on other
degrees of freedom of
the BSC-ISI (Pitch?)**



**Need Broadband low
frequency
performance =>
Sensor Correction**