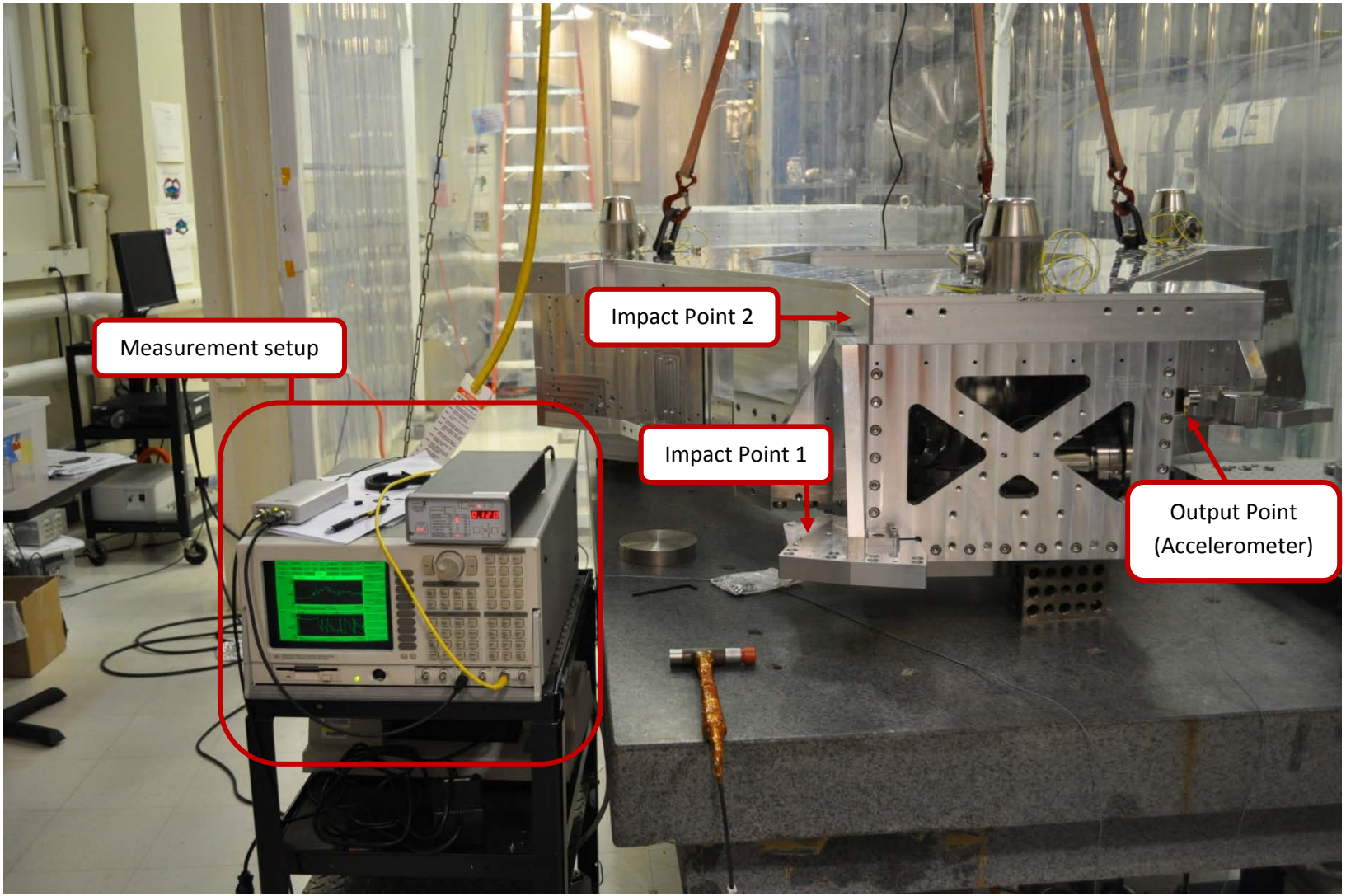
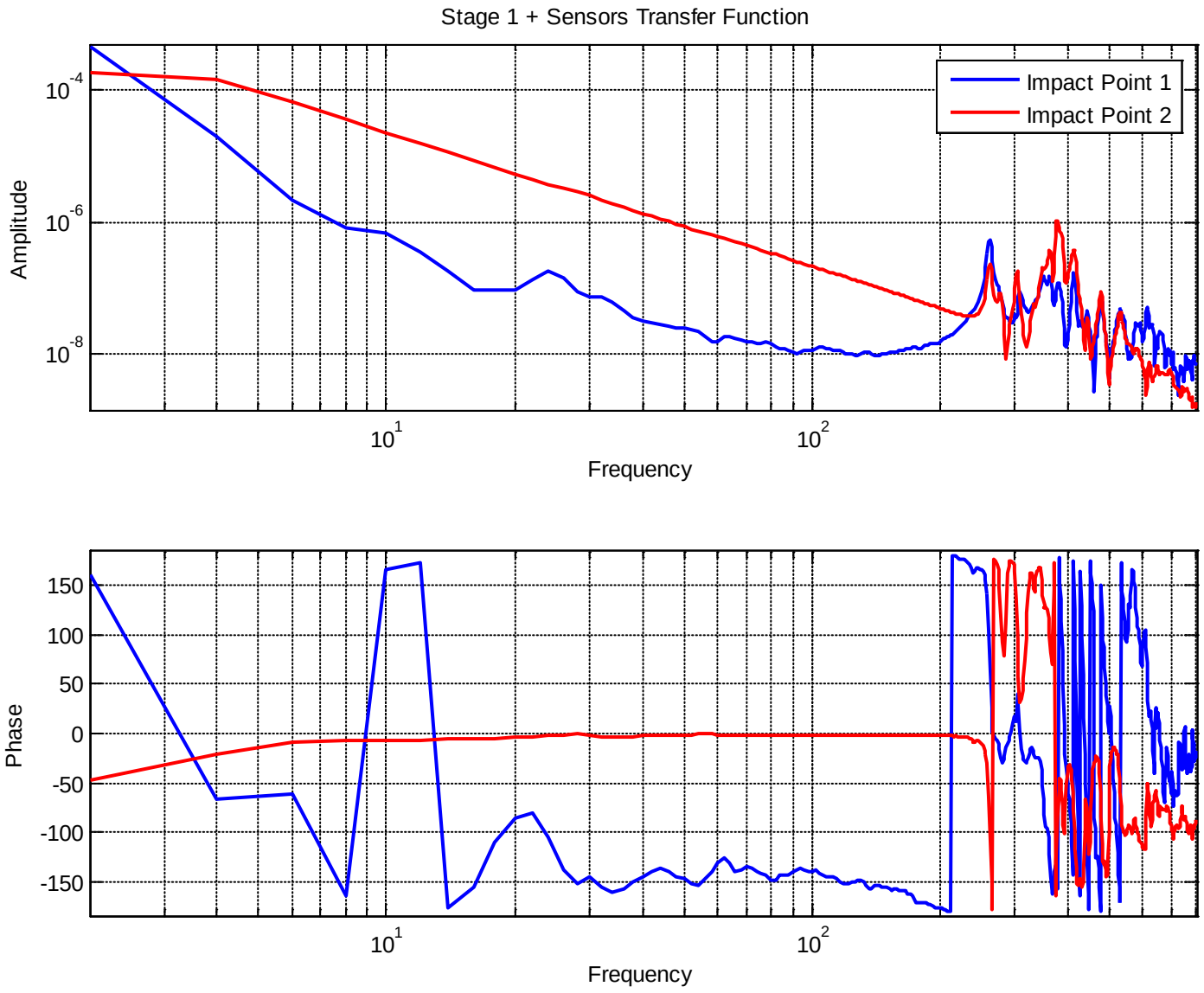
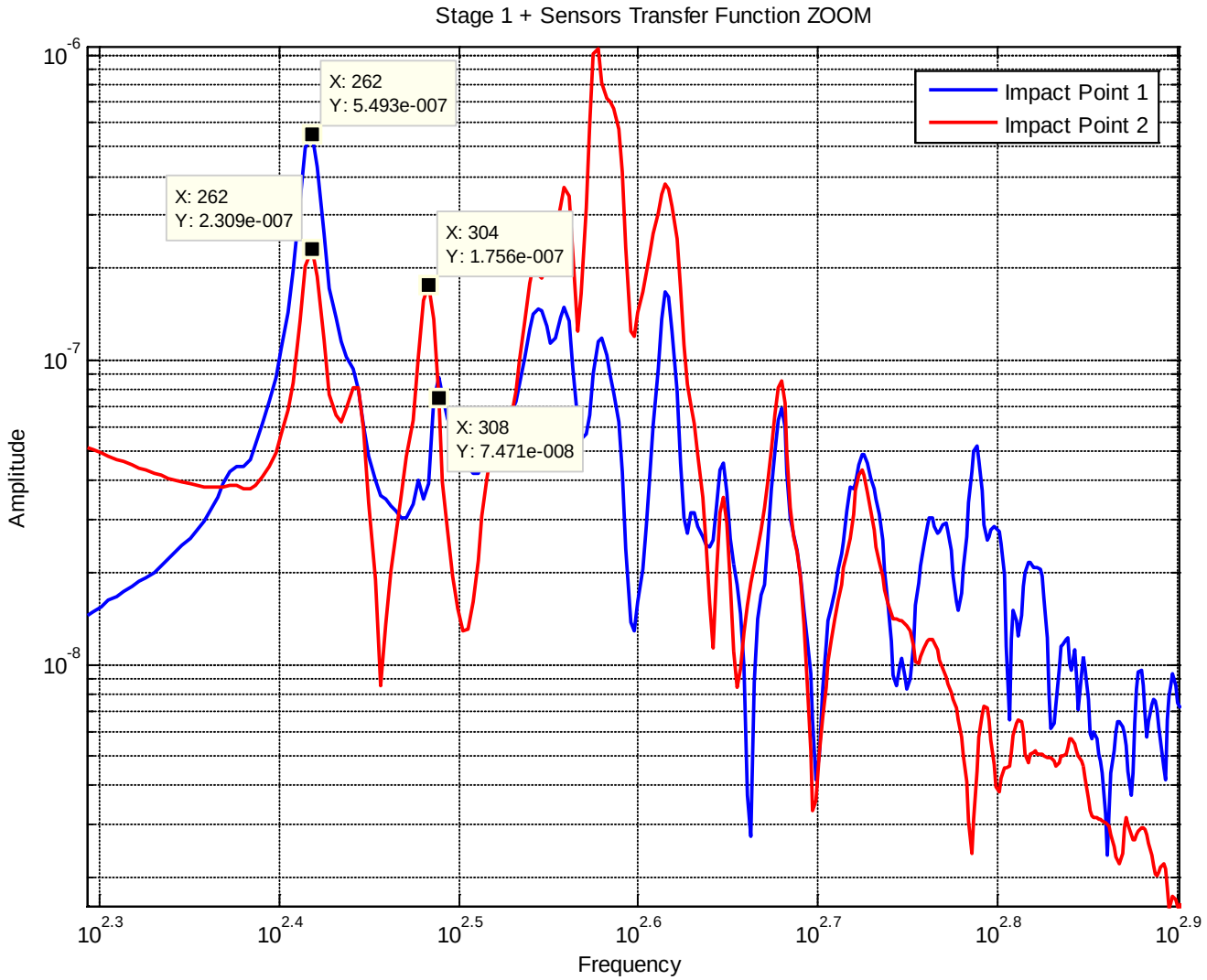
This report presents the first transfer functions of the Stage 1 with sensors put on it (one pod and two L4Cs in each corner).

1) Set up and transfer functions




Stage 1 + Sensors Transfer Function
Impact Point 1
Impact Point 2
Amplitude
10^-4
10^-6
10^-8
10^1
10^2
Frequency
Phase
150
100
50
0
-50
-100
-150
10^1
10^2
Frequency

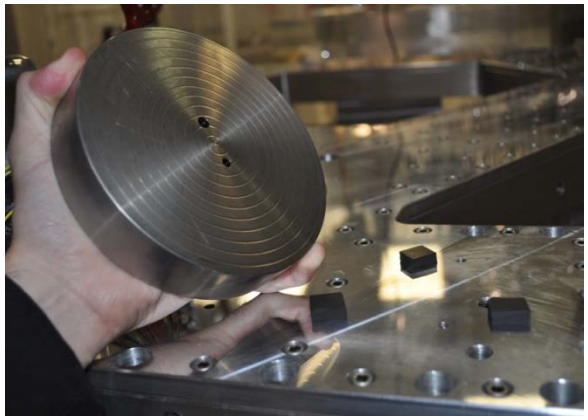


The first resonance is 262 Hertz, and the second is 308 Hertz for a horizontal excitation and 304 Hertz for a vertical one. Thus we can observe a similarity of the modes with the direction of excitation. This shows a presence of pure global modes.

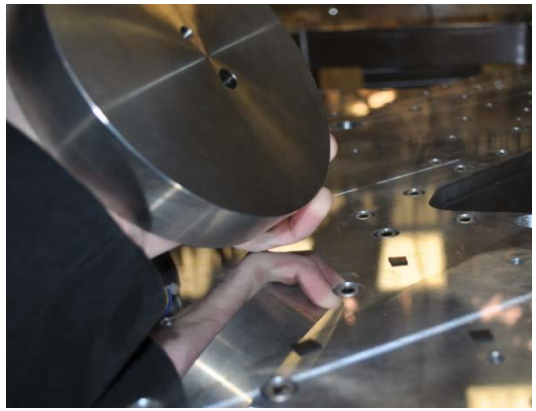
2) Damping Experiments
   a) In Corner

We add masses mounted on Viton pads. Thus we create a mass damper system. One mass damper is put per corner, following four configurations :

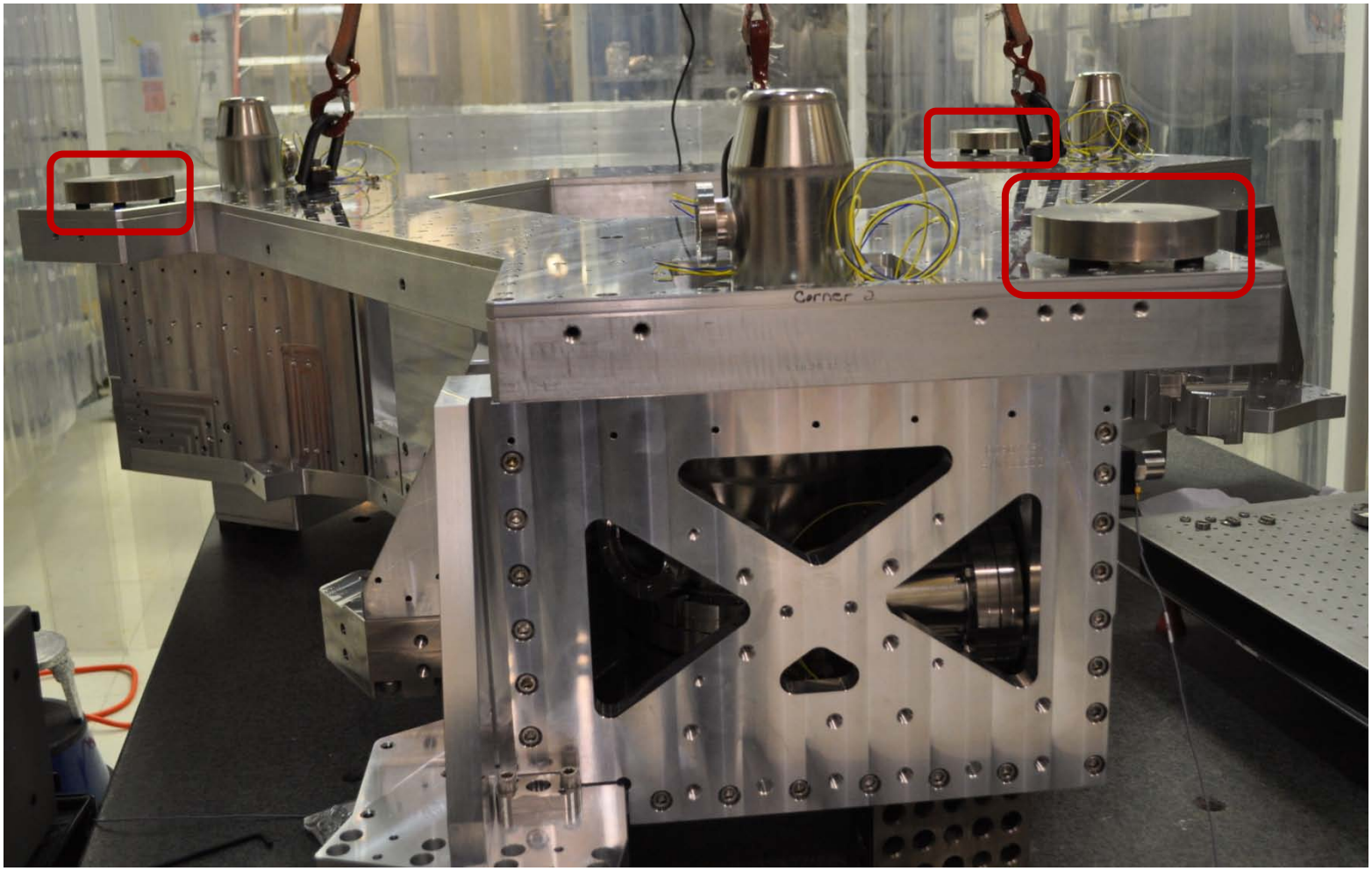
- 10 Lb Mass Damper on big pads of Viton
- 10 Lb Mass Damper on small pads of Viton
- 20 Lb Mass Damper on big pads of Viton
- 20 Lb Mass Damper on small pads of Viton

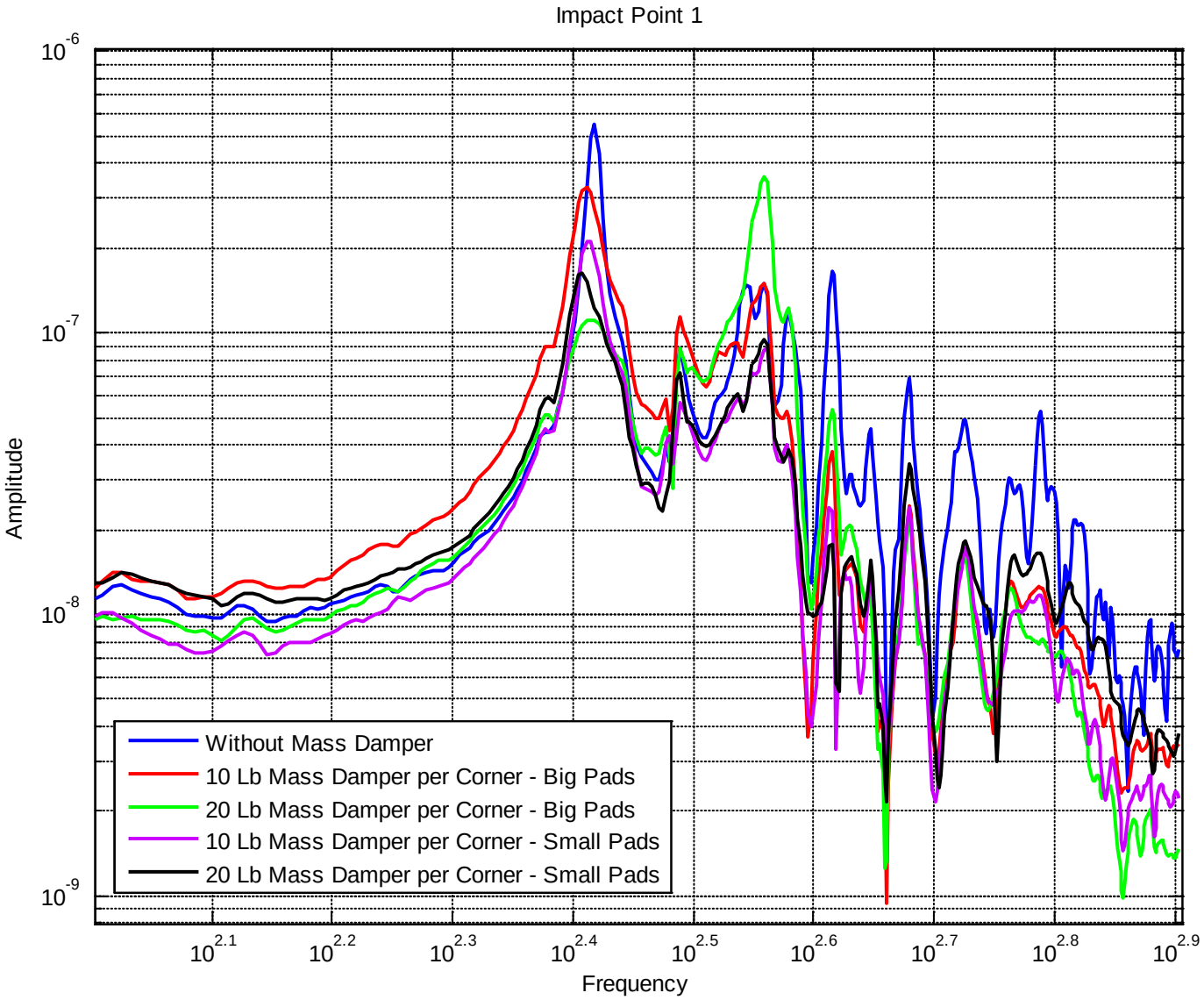


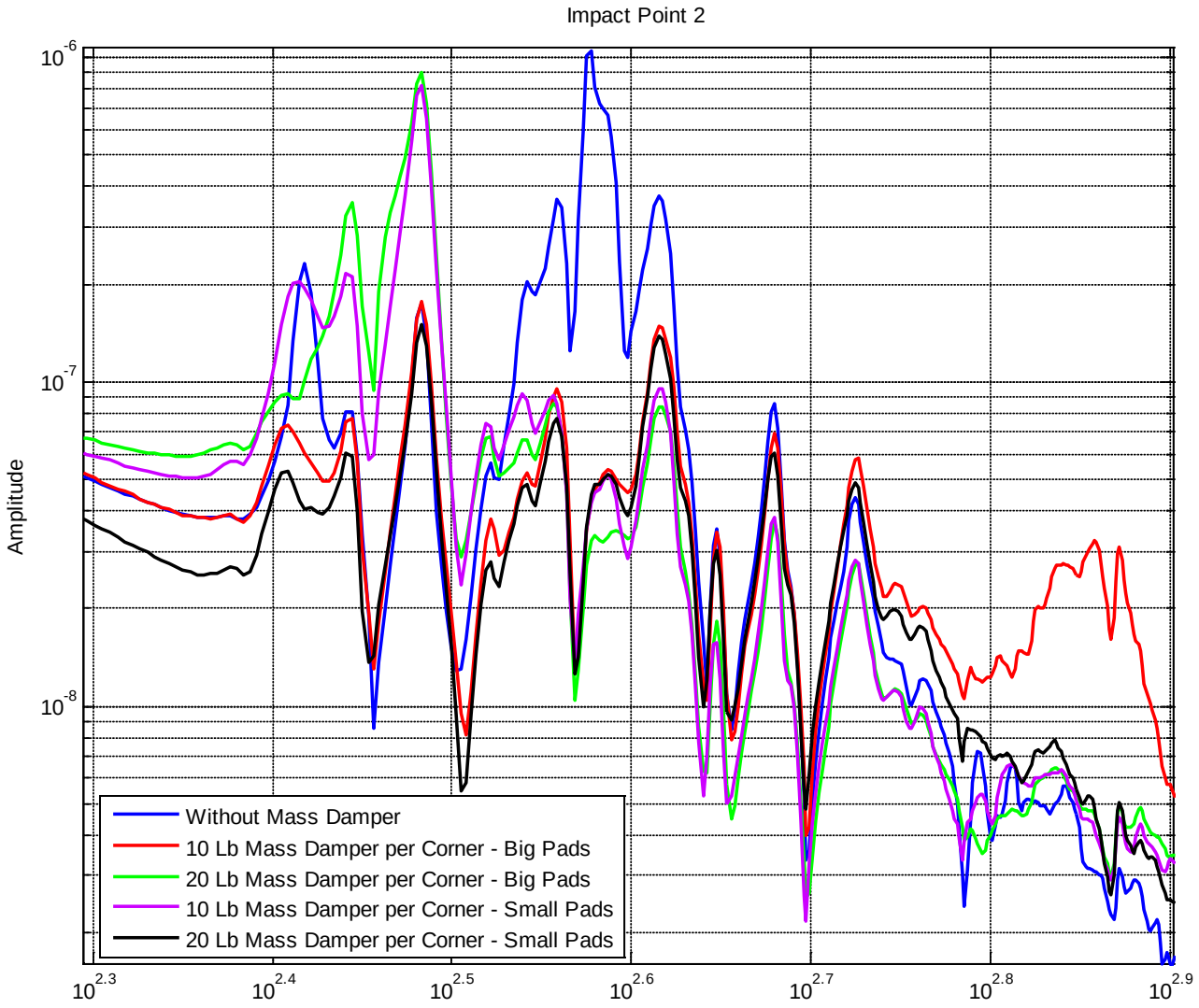
Big Pads of Viton



Small Pads of Viton


Corner 3

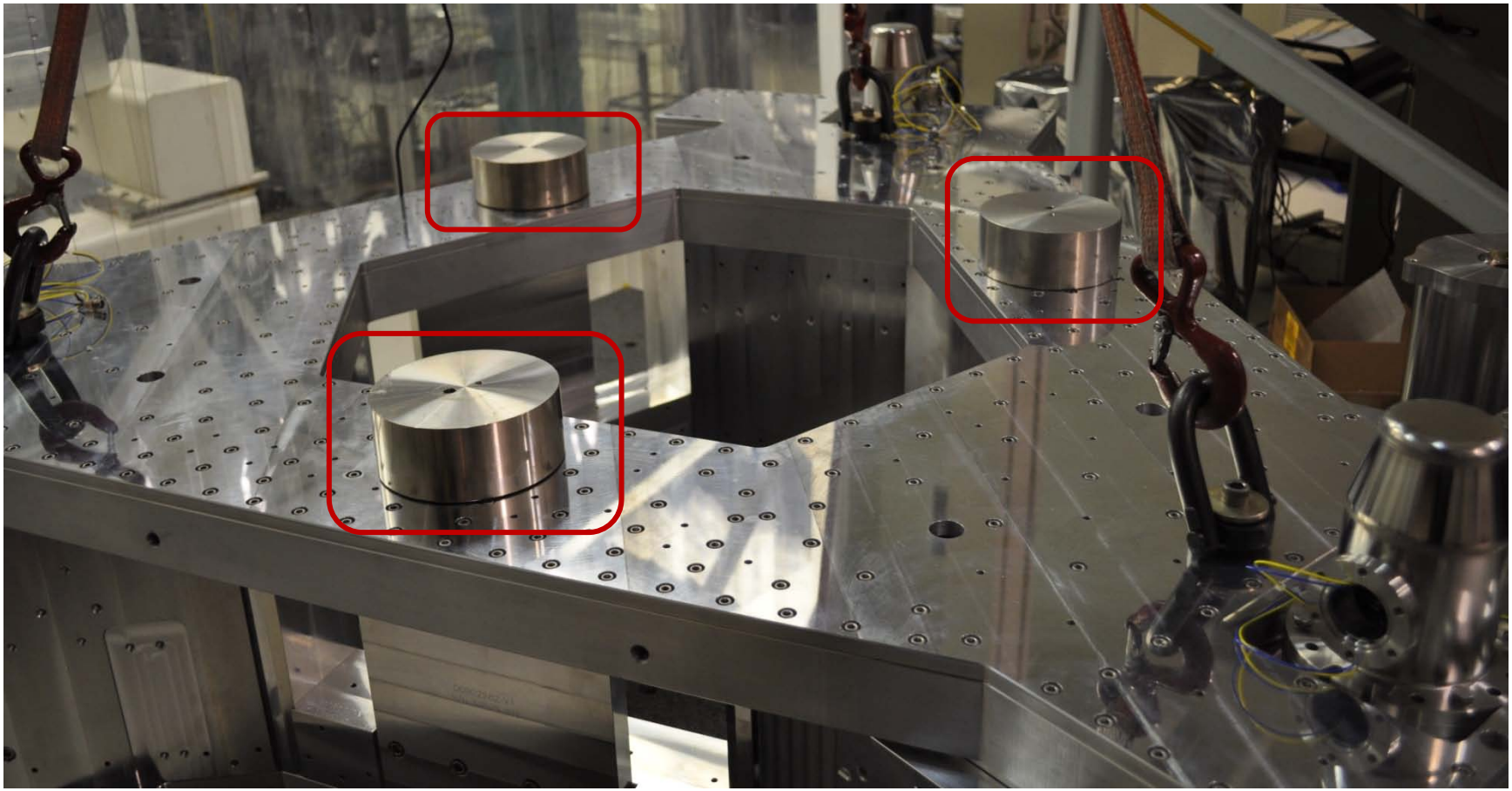

Impact Point 1
Amplitude
Frequency
10^{-6}
10^{-7}
10^{-8}
10^{-9}
$10^{2.1}$
$10^{2.2}$
$10^{2.3}$
$10^{2.4}$
$10^{2.5}$
$10^{2.6}$
$10^{2.7}$
$10^{2.8}$
$10^{2.9}$
Without Mass Damper
10 Lb Mass Damper per Corner - Big Pads
20 Lb Mass Damper per Corner - Big Pads
10 Lb Mass Damper per Corner - Small Pads
20 Lb Mass Damper per Corner - Small Pads



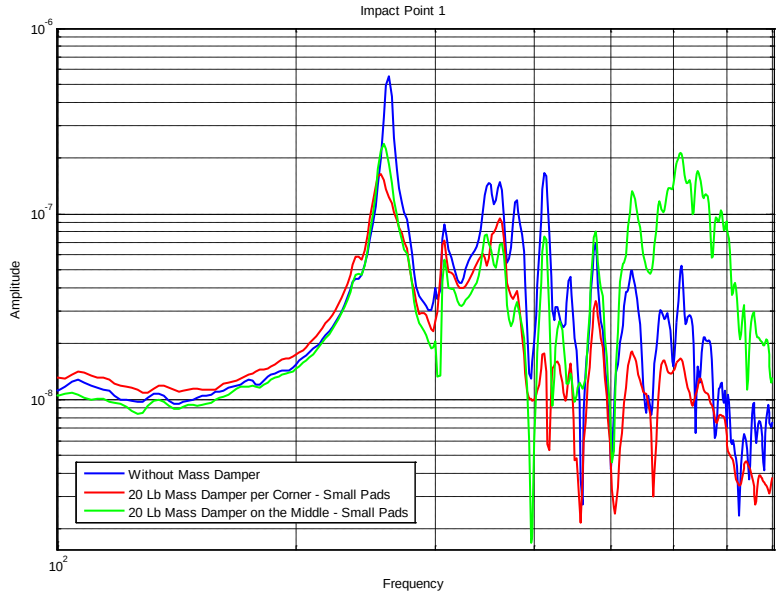
With 10 Lbs or 20 Lbs Mass Dampers, the first mode is very well damped. The other modes are damped only if we use the 20 Lbs/Small Pads configuration. In this configuration, the Q first resonance is down by a factor of 6.

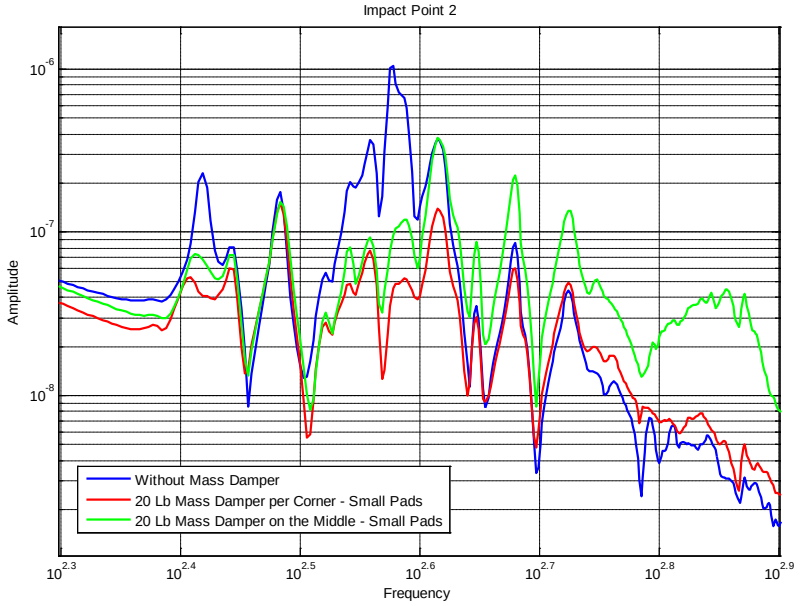
b) Position

The goal of this step is to try different positions where to put mass dampers on the Stage.

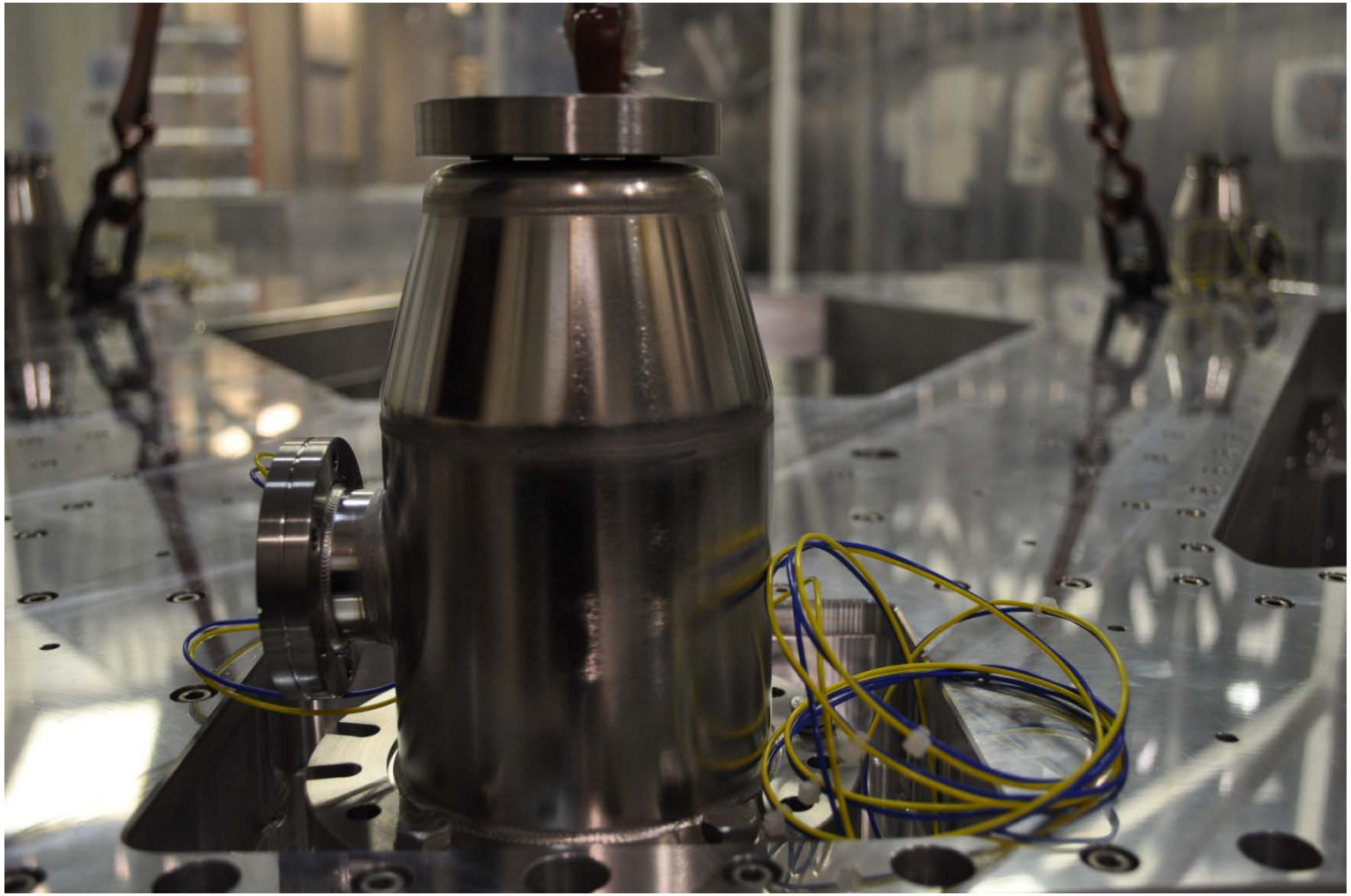


20 Lbs Mass Dampers on the middle of Stage 1

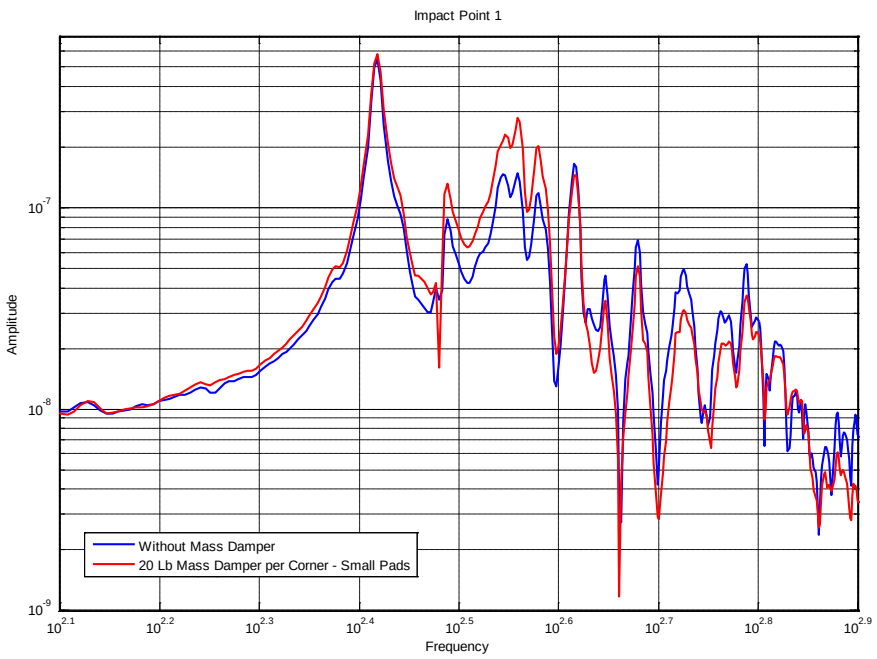


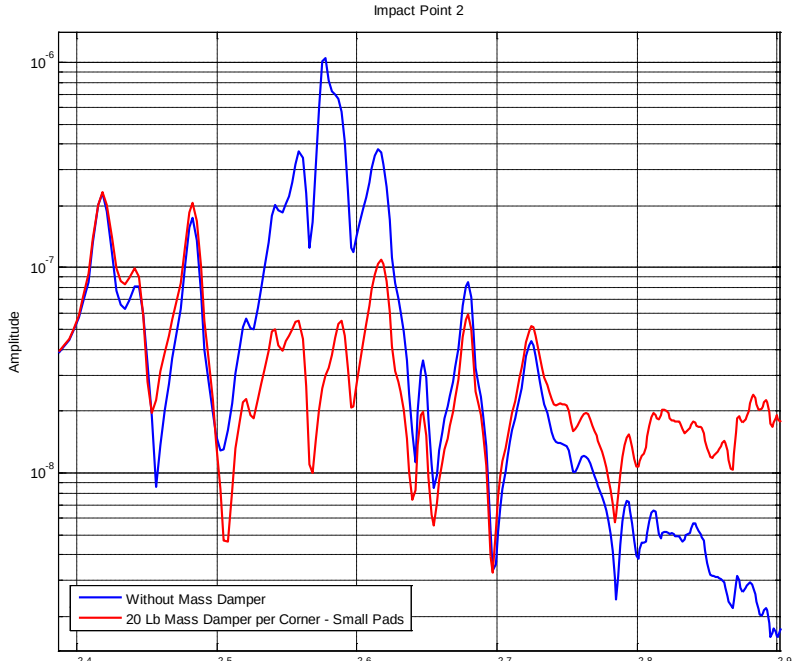


Results are better if we put the Mass Dampers in the corners. This result confirms the fact that there is more displacement in the corners compared to the middle.



1 Lb Mass Damper on the top of the L4Cs





The goal of this configuration is to show if there is some local modes due to the L4Cs. We cannot see a lot of variations, except for the vertical excitation where a damp effect is present around 320 Hertz. This effect is not important enough to make a conclusion. More tests are necessary.

We obtain the same result with a mass damper on the other L4C (inside the door of Stage 1).