These measurements of the ETMY charge were done manually using awggui for excitation and diaggui for data processing.

For these measurements the LL quadrant was fixed (the ESD LP filter was actually connected to the LL driving channel instead of the BIAS channel as it should have been therefore attenuating our 4Hz driving signal by a factor of 32 or so). So it is the first time we have charging measurements for that quadrant, I will also measure the other quadrants to look for repeatability of this measurement technique.

I drove a sinusoidal excitation at 4Hz and amplitude 30000 counts which is equivalent to 91.5 Volts on the ESD ($30000*20*40/2^{18}$, as the DACs drive +-10V and they are 18 bits and then we have an amplifier of Gain 40). Notice that this actuation signal amplitude is divided to the deflection measurements in the tables below to get the standardised plots at the end of this document.

Then we monitor the deflection of the ETMY mass both in Pitch and Yaw looking at the *oplev*. The *oplev* has been carefully centred to the QPD before the measurements.

The magnitudes of the deflection given below are in *urad* and are obtained through a power spectrum plot of the oplev pitch and yaw signals. This power spectrum was measured with a BW = 0.01Hz on the range between 1 – 5 Hz and averaged **3** times.

During the measurements the coherence between excitation and Pitch and Yaw was monitored to be sure that the excitation was observed. I also measured the phase (in degrees) of the transfer function between excitation and oplev pitch and yaw (the phase was measured to confirm it is 180 degrees different for the deflections with + and - BIAS). The same excitation was applied to the 4 quadrants of the ESD.

The ETMY pressure at PT-410 is 4.5e-8 good enough for these measurements. ISI Watchdog ST1 and ST2 green so no much drift of the oplev. Next I show the results:

Driving UR quadrant:

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	6.573e-3	-12	6.988e-3	-13
+195.3	2.390e-3	-14	3.026e-3	-13
-195.3	5.056e-3	174	6.034e-3	165
-390.5	9.021e-3	167	10.192e-3	166

Driving UL quadrant: Note that in this measurement for VBIAS +195Volt we saw no deflection in Yaw (I did write a number but it is just noise with a coherence of less than 0.7)

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	6.332e-3	168	4.224e-3	166
+195.3	1.503e-3	168	0.44e-3	143
-195.3	7.102e-3	-11	7.515e-3	-16
-390.5	12.303e-3	-14	11.272e-3	-13

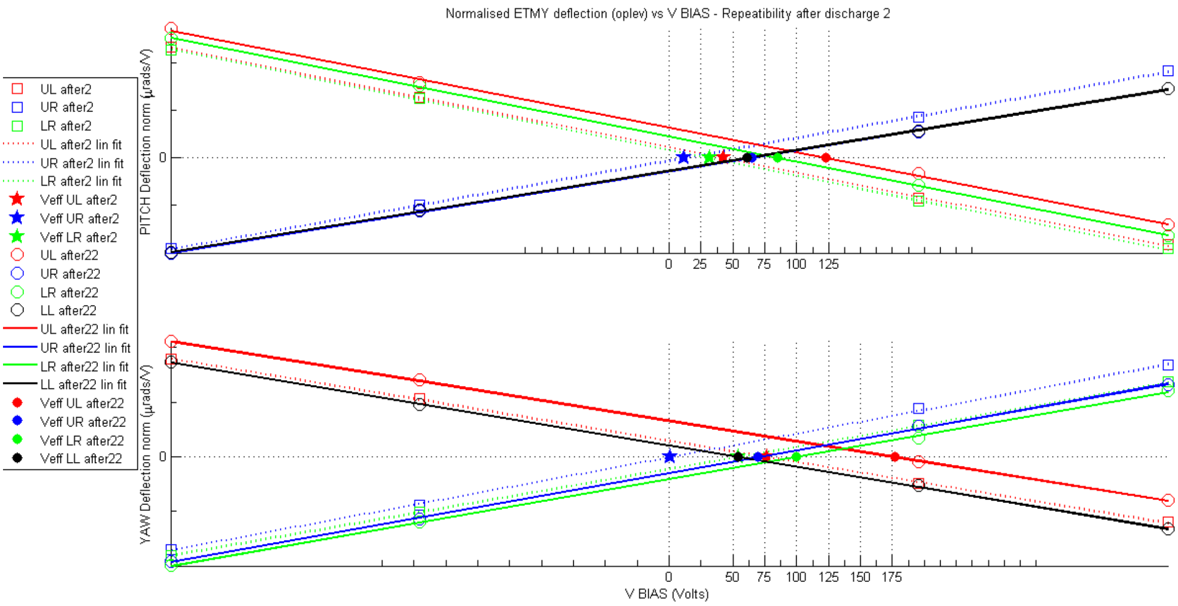
Driving LL quadrant: This is the first charge measurements we have for this quadrant.

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	6.582e-3	-14	7.069e-3	167
+195.3	2.50e-3	-13.3	2.811e-3	167
-195.3	4.952e-3	166	5.074e-3	-13
-390.5	8.952e-3	165.4	9.292e-3	-13.4

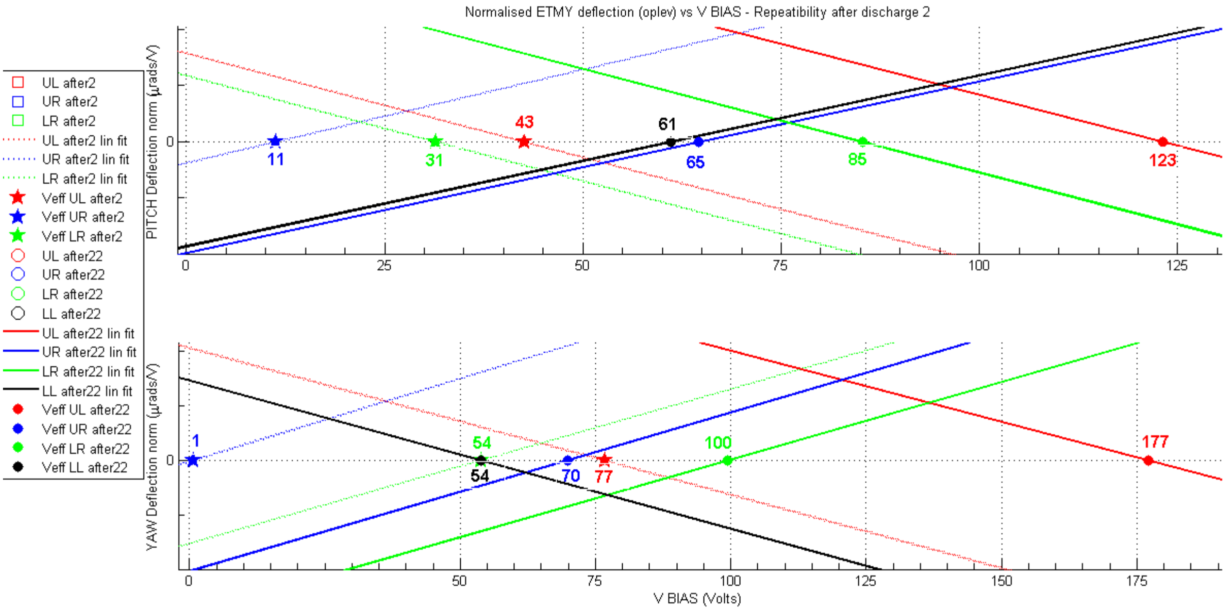
Driving LR quadrant:

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	7.363e-3	164	6.484e-3	-15
+195.3	2.592e-3	162.5	1.873e-3	-13
-195.3	6.826e-3	-13.6	6.40e-3	166
-390.5	11.2815e-3	-13.4	10.604e-3	166

Plotting the above results in the standard way "Normalised deflection [µrad/V] vs V BIAS", the normalisation of the deflection is by the amplitude of the excitation = 91.5Volt. I plot the new results in comparison with the results obtained 3 days ago



And next we zoom on the zero crossing:



	UL	UR	LL	LR
Veff PITCH [V]	123	65	61	85
PITCH slope [10^{-7} µrad/V]	-2.565	2.1605	2.154	-2.612
Veff YAW [V]	177	70	54	100
YAW slope [10^{-7} µrad/V]	-2.178	2.428	-2.271	2.374