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

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 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 7.2e-8 good enough for these measurements and the oplev was realigned within half urad both in Pitch and Yaw. 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	$8.26 \cdot 10^{-3}$	-15.34	$8.93 \cdot 10^{-3}$	-11.12
+195.3	$3.86 \cdot 10^{-3}$	-19.2	$4.74 \cdot 10^{-3}$	-13.15
-195.3	$4.51 \cdot 10^{-3}$	162.5	$4.7 \cdot 10^{-3}$	167.7
-390.5	$8.58 \cdot 10^{-3}$	166.9	$9.03 \cdot 10^{-3}$	166.6

Driving UL quadrant:

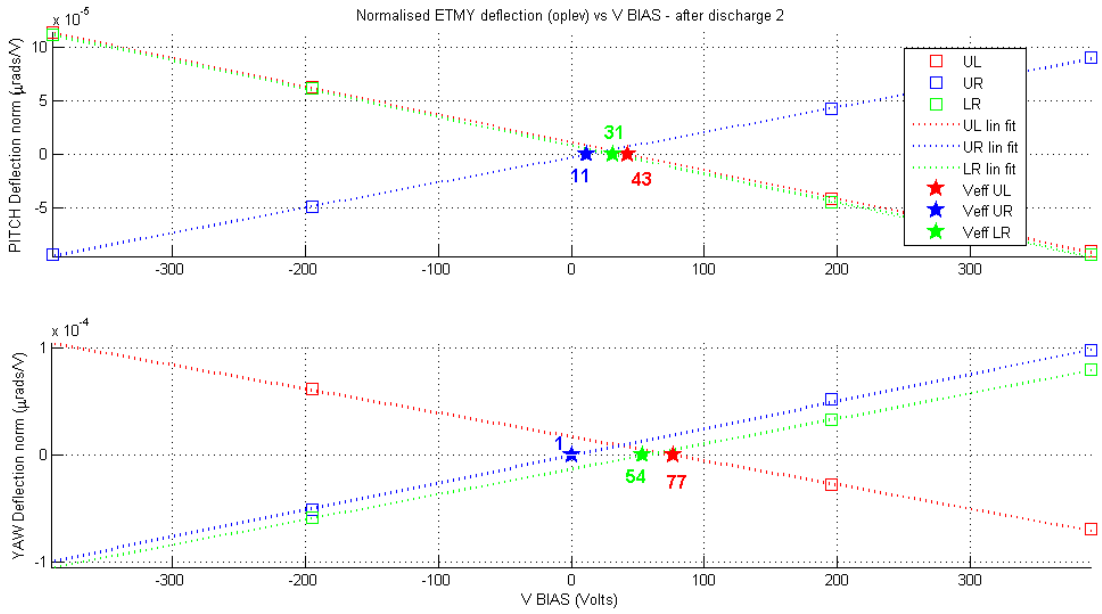
V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	$8.27 \cdot 10^{-3}$	166.7	$6.39 \cdot 10^{-3}$	167.7
+195.3	$3.8 \cdot 10^{-3}$	169.7	$2.56 \cdot 10^{-3}$	165.6
-195.3	$5.72 \cdot 10^{-3}$	-16.8	$5.68 \cdot 10^{-3}$	-12
-390.5	$10.45 \cdot 10^{-3}$	-12.35	$9.58 \cdot 10^{-3}$	-13.3

Driving LL quadrant: This quadrant had a very low excitation SNR and no indication of presence of excitation so no measurements were taken.

Driving LR quadrant:

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	$8.63 \cdot 10^{-3}$	166.35	$7.3 \cdot 10^{-3}$	-13
+195.3	$4.15 \cdot 10^{-3}$	163.7	$3.05 \cdot 10^{-3}$	-14
-195.3	$5.6 \cdot 10^{-3}$	-14.1	$5.4 \cdot 10^{-3}$	168.5
-390.5	$10.24 \cdot 10^{-3}$	-12.3	$9.62 \cdot 10^{-3}$	168

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.



	UL	UR	LR
Veff PITCH [V]	**43**	**11**	**31**
PITCH slope [10^{-7} µrad/V]	**-2.63**	**2.35**	**-2.655**
Veff YAW [V]	**77**	**1**	**54**
YAW slope [10^{-7} µrad/V]	**-2.25**	**2.54**	**2.365**