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. The phase (in degrees) of the transfer function between excitation and oplev pitch and yaw was rounded to 0 and +-180. The same excitation was applied to only 2 quadrants of the ESD (UL and LR).

For these measurements we did not re-center the oplev perfectly on QPD, but there's still plenty of signal and sum. Misalignment on the oplev is: Pitch -2 [urad] and Yaw -1 [urad]

Next I show the results:

Driving UL quadrant:

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	8.56e-3	180	6.75e-3	180
+195.3	3.75e-3	180	2.53e-3	180
-195.3	5.34e-3	0	5.60e-3	0
-390.5	1.02e-2	0	9.76e-3	0

Driving LR quadrant:

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	8.76e-3	180	7.51e-3	0
+195.3	3.70e-3	180	3.04e-3	0
-195.3	5.57e-3	0	5.124e-3	180
-390.5	1.011e-2	0	9.63e-3	180

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.
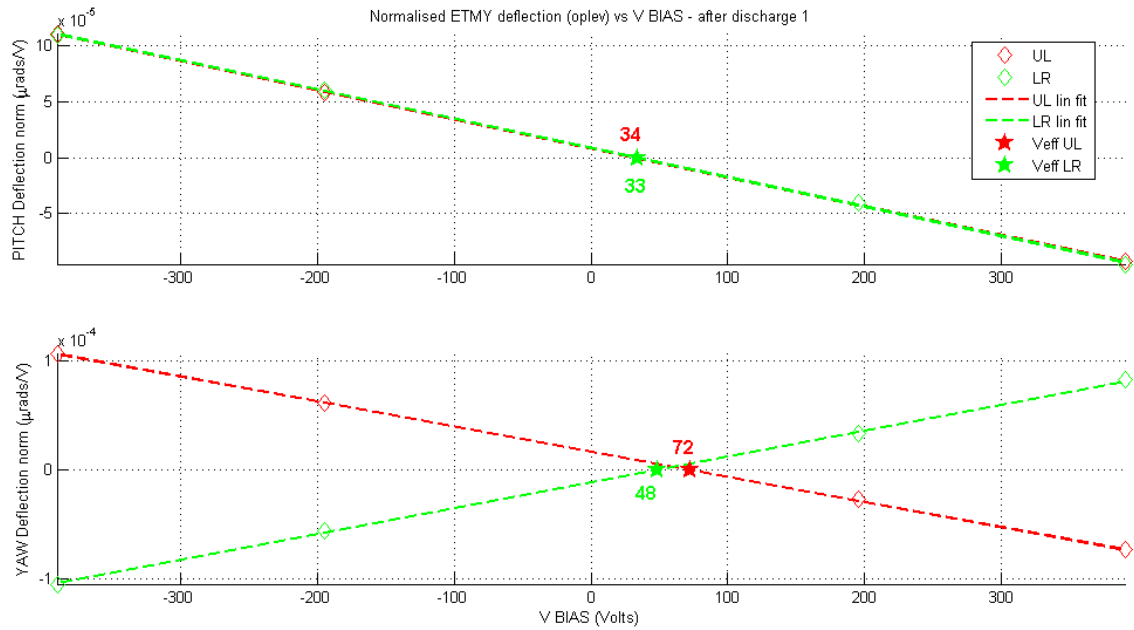
	UL	LR
Veff PITCH [V]	34	33
PITCH slope [10^{-7} µrad/V]	-2.61	-2.63
Veff YAW [V]	72	48
YAW slope [10^{-7} µrad/V]	-2.30	2.37