These measurements of the ETMY charge were done manually using awggui for excitation and diaggui for data processing. The data taken took place between UTC (2014-08-28 04:40:00) and UTC (2014-08-28 05:55:00). This is the last measurement before opening the ion pump gate valve at ETMY to confirm its charging properties.

NOTE: The measurements were taken under relatively windy conditions at End-Y so the suspension was not very stable. But I managed to complete the measurement.

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 = 0.02Hz** (actual value is **0.0234375**) 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 3.7e-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: low coherence at VBIAS -195V, changed to a different VBIAS -250V.

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	6.2312e-3	-17	6.7503e-3	-10
+195.3	4.1161e-3 (low coherence 0.98)	-10	3.3726e-3 (low coherence 0.97)	-14
-250	**1.9676e-3 (low coherence 0.98)**	**168**	**3.499e-3 (low coherence 0.98)**	**164**
-390.5	4.4498e-3	165	5.7311e-3	167

Driving UL quadrant: low coherence at VBIAS +195V in yaw it was so low that I decided to use different VBIAS +305V instead

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)

+390.5	4.3234e-3	167	2.9304e-3	164
+305	3.2797e-3	163	1.7872e-3 (low coherence 0.95)	172
-195.3	5.144e-3	-10	5.5053e-3	-15
-390.5	8.4492e-3	-14	8.5773e-3	-12

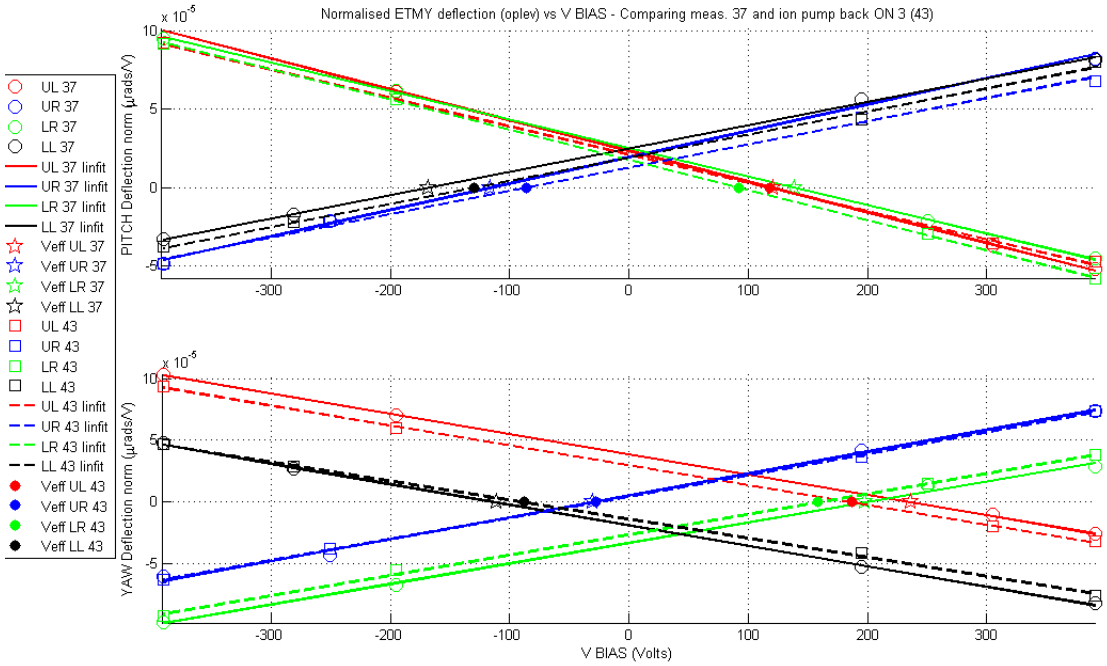
Driving LL quadrant: Very low coherence at VBIAS -195V it was so low that I decided to use different VBIAS -280V instead

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	7.3318e-3	-13	6.9197e-3	164
+195.3	3.9897e-3	-21	3.7657e-3 (low coherence 0.98)	165
-280.5	**2.0216e-3 (low coherence 0.91)**	**173**	**2.6476e-3 (low coherence 0.98)**	**-13**
-390.5	3.4375e-3	163	4.2988e-3	-8

Driving LR quadrant:

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	5.299e-3	169	3.482e-3 (low coherence 0.97)	-17
+250	2.7386e-3 (low coherence 0.96)	171	1.3487e-3 (low coherence 0.9)	-12
-195.3	5.182e-3	-13	5.0835e-3	167
-390.5	8.4e-3	-10	8.4705e-3	167

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. We compare it with the previous measurements (labelled suffix 37, with the current ones is 43):



	UL - 43	UR -43	LR -43	LL - 43
Veff PITCH [V]	118	-86	93	-130
PITCH slope [10^{-7} µrad/V]	-1.8042	1.4887	-1.9206	1.4757
Veff YAW [V]	187	-28	158	-87.5
YAW slope [10^{-7} µrad/V]	-1.6060	1.7312	1.6495	-1.5438