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 (2014-08-22 03:00:00) and UTC (2014-08-22 06:00:00). This is the second measurement taken after closing the gate valve of the ion pump in ETMY. This happened at about UTC 2014-08-20 23:30:00.

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 4.9e-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 and +195V

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	7.24526e-3	-11	6.61164e-3	-17
+195.3	4.58929e-3 (low coherence 0.98)	-13	3.66291e-3 (low coherence 0.97)	-15
-195.3	1.76633e-3 (low coherence 0.91)	-179	2.20534e-3 (low coherence 0.91)	163
-390.5	4.18831e-3	171	5.81104e-3	163

Driving UL quadrant: low coherence at VBIAS +195V

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	4.57761e-3	162	2.56937e-3	170
+195.3	1.20898e-3 (low coherence	173	0.604786e-3 (low coherence	35

	0.85)		0.43)	
-195.3	5.57503e-3	-11	5.96472e-3	-15
-390.5	9.39501e-3	-12	8.62718e-3	-10

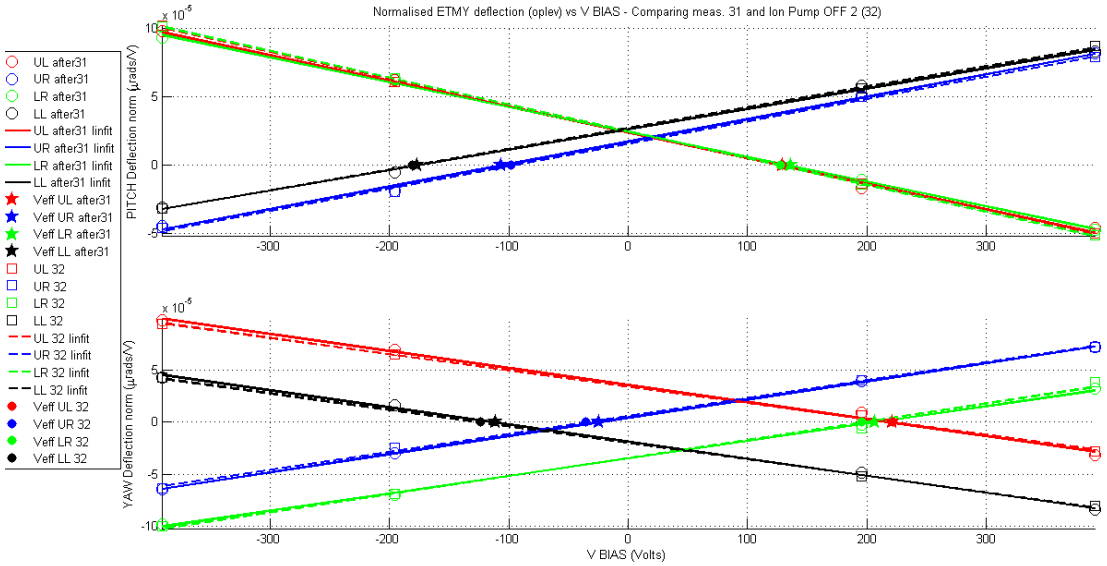
Driving LL quadrant: Very low coherence at VBIAS -195V

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	7.97656e-3	-16	7.36175e-3	164
+195.3	5.16491e-3	-14	4.7266e-3	169
-390.5	2.90357e-3 (low coherence 0.97)	161	3.88671e-3	-11

Driving LR quadrant: low coherence at VBIAS +195V

V BIAS (Volts)	Pitch		Yaw	
	Mag (urad)	Phase (deg)	Mag (urad)	Phase (deg)
+390.5	4.67916e-3	169	3.51576e-3	-16
+195.3	1.28228e-3 (low coherence 0.8)	152	0.5037e-3 (low coherence 0.2)	131
-195.3	5.83998e-3	-9	6.3183e-3	168
-390.5	9.31279e-3	-12	9.12605e-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. We compare it with the previous measurements (labelled suffix 31, with the current ones is 32):



	UL - 31	UL - 32	UR - 31	UR -32	LR - 31	LR -32	LL - 31	LL - 32
Veff PITCH [V]	129	129	-107	-98	136	128	-177	-181
PITCH slope [10^{-7} µrad/V]	-1.8801	-1.9422	1.6476	1.6343	-1.8173	-1.9633	1.4952	1.5172
Veff YAW [V]	221	222	-25	-36	206	195	-112	-124
YAW slope [10^{-7} µrad/V]	-1.6318	-1.5521	1.7435	1.7176	1.6707	1.7391	-1.6348	-1.5803

These results are an indication of the good resolution of the measuring method (about 10Volts). The 2 measurements are 9 hours apart with the ion pump gate valve closed at End-Y and we see absolutely no change in charge for any quadrant and for both orientations.

Another interesting point is the exact overlap on the response in pitch for quadrants labelled UL and LR. However notice that actually based on the displacement response of these quadrants I have identified that the quadrant labelled LR is actually LR but the quadrant labelled UL is actually LL. So the two low quadrants of the ESD see exactly the same charge from the point of view of the pitch response and nearly also the same from the Yaw response. You can't say the same about the upper quadrants.