Diamond target status

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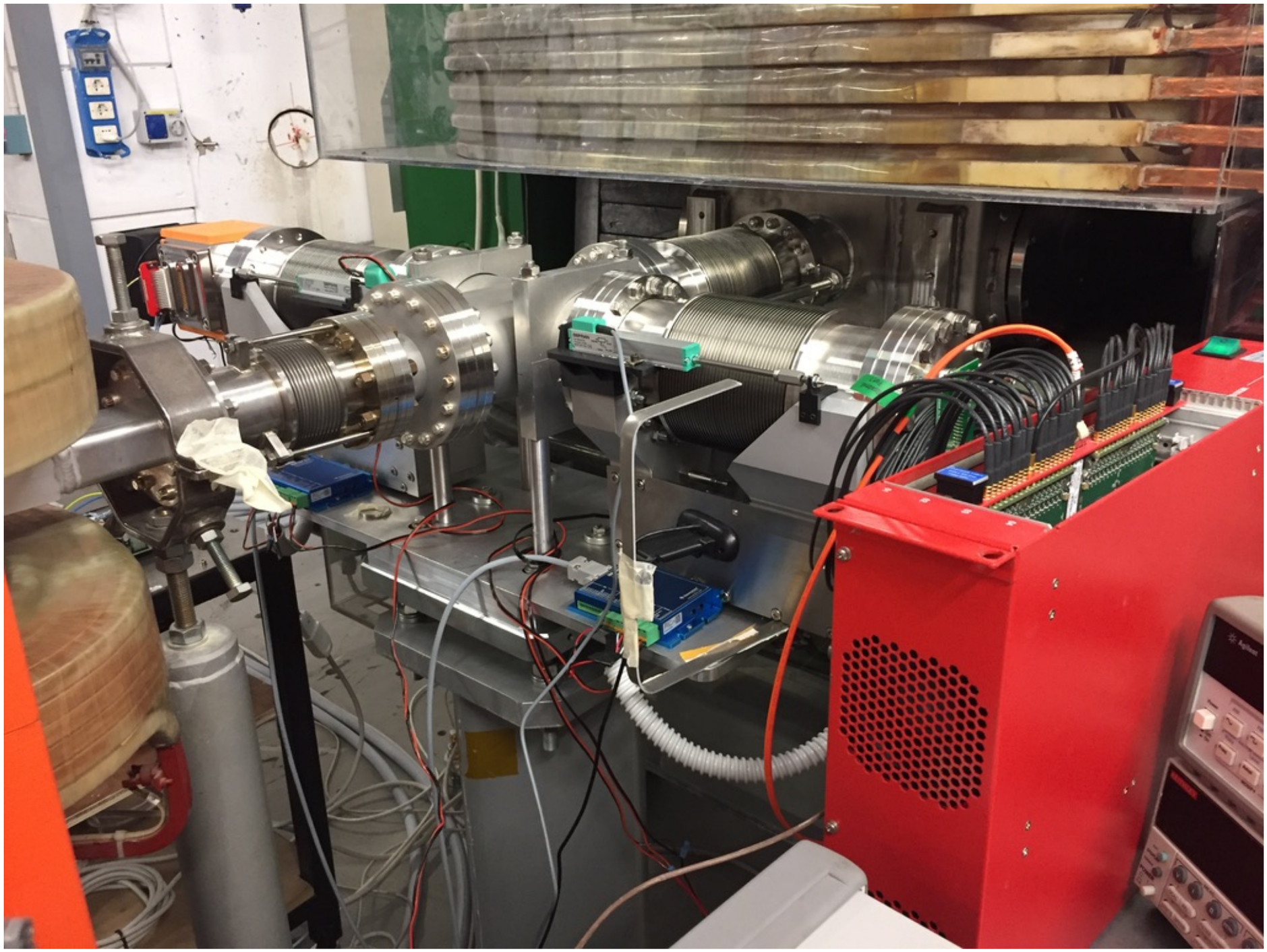
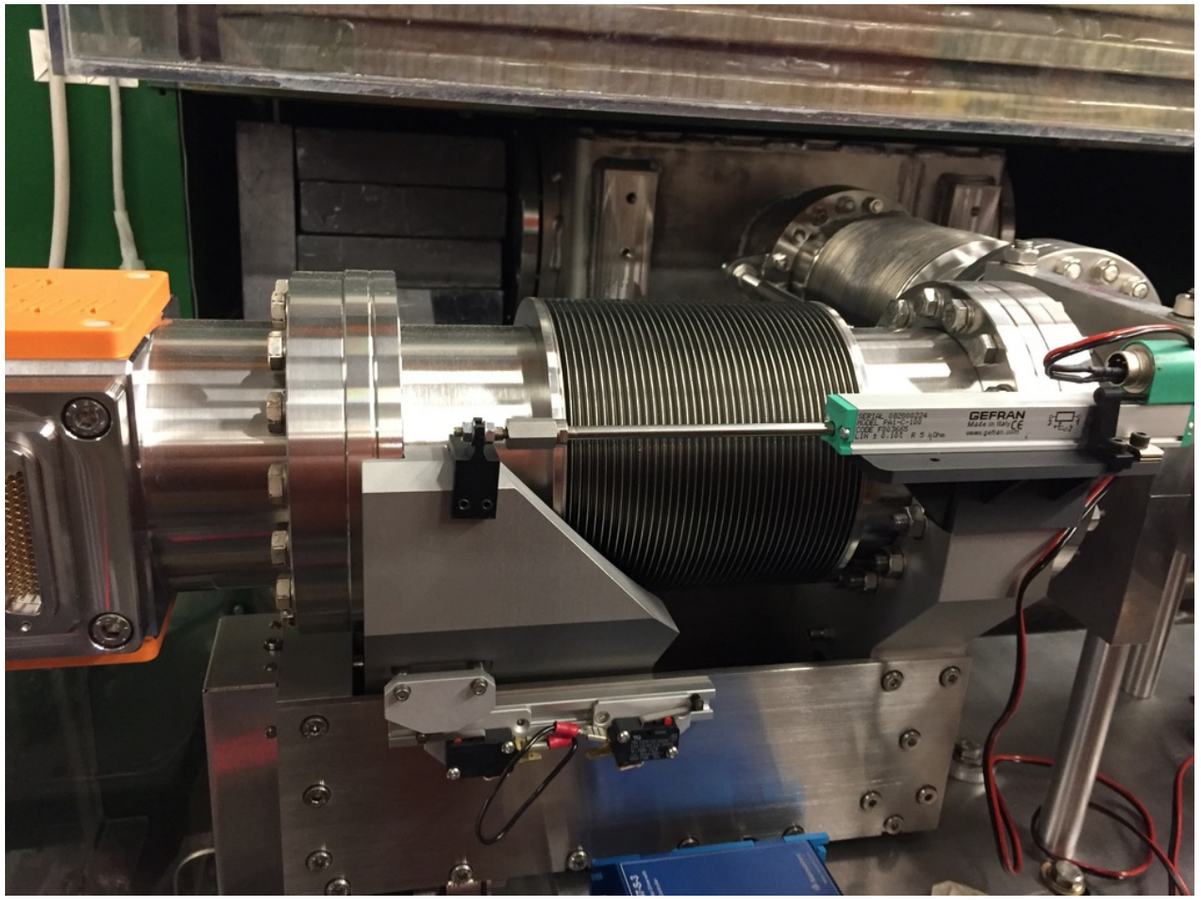
PADME target zone



Target status

- Target stably ON since September 2018 up to shutdown
- 2 out of 32 strips not responding (it seems acceptable)
- Target DCS GUI available for shifter and expert
- Target position read-back available only one week before shutdown
- No hardware intervention expected before
- Final target calibration strategy still under refinement

Motor position feedback



Many thanks to:
-**Lollo** for providing the two linear potentiometers
-**Emilio** for designing, realizing and mounting the 3D printed brackets
-**Federica O.** for reading in DCS and PADME MONITOR and calibrating the two positions.

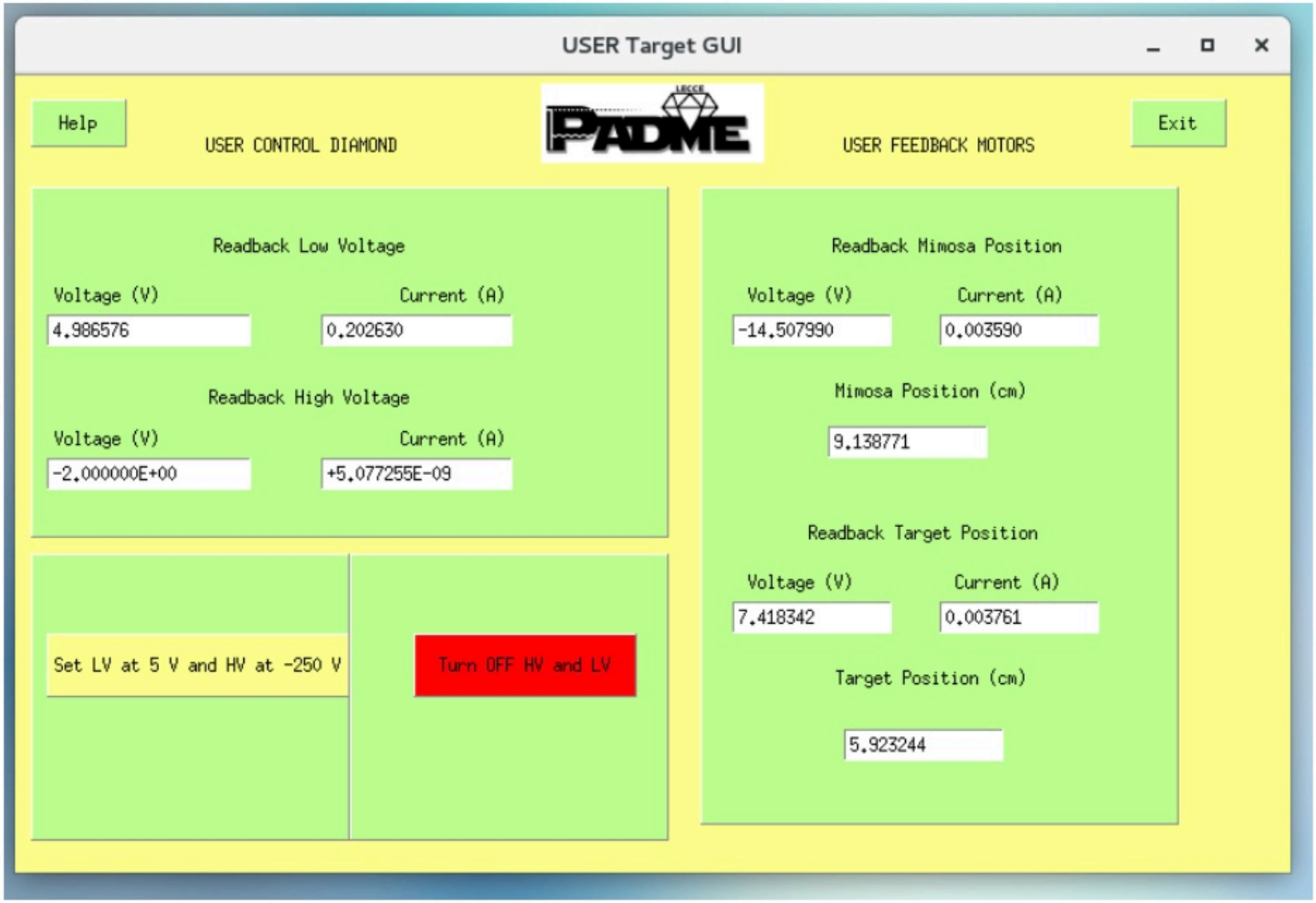
Mimosa and Target Position, High Voltage and Low Voltage Target Values

Timestamp	2018-11-19 15:45:03
Mimosa Position	-0.699483
Target Position	4.994344
Target HV Voltage	-2.500000E+02
Target HV Current	-2.221526E-06
Target LV Voltage	4.982249
Target LV Current	0.200316

Not calibrated here

Target position in data taking:
-early runs x=5.1
-since then x=5.2mm

Shifter target GUI and Monitor



Always available for shifters on Target PC

Just two bottoms:
-Turn ON target
-Turn OFF target

All shown values are read and stored every 30 sec.

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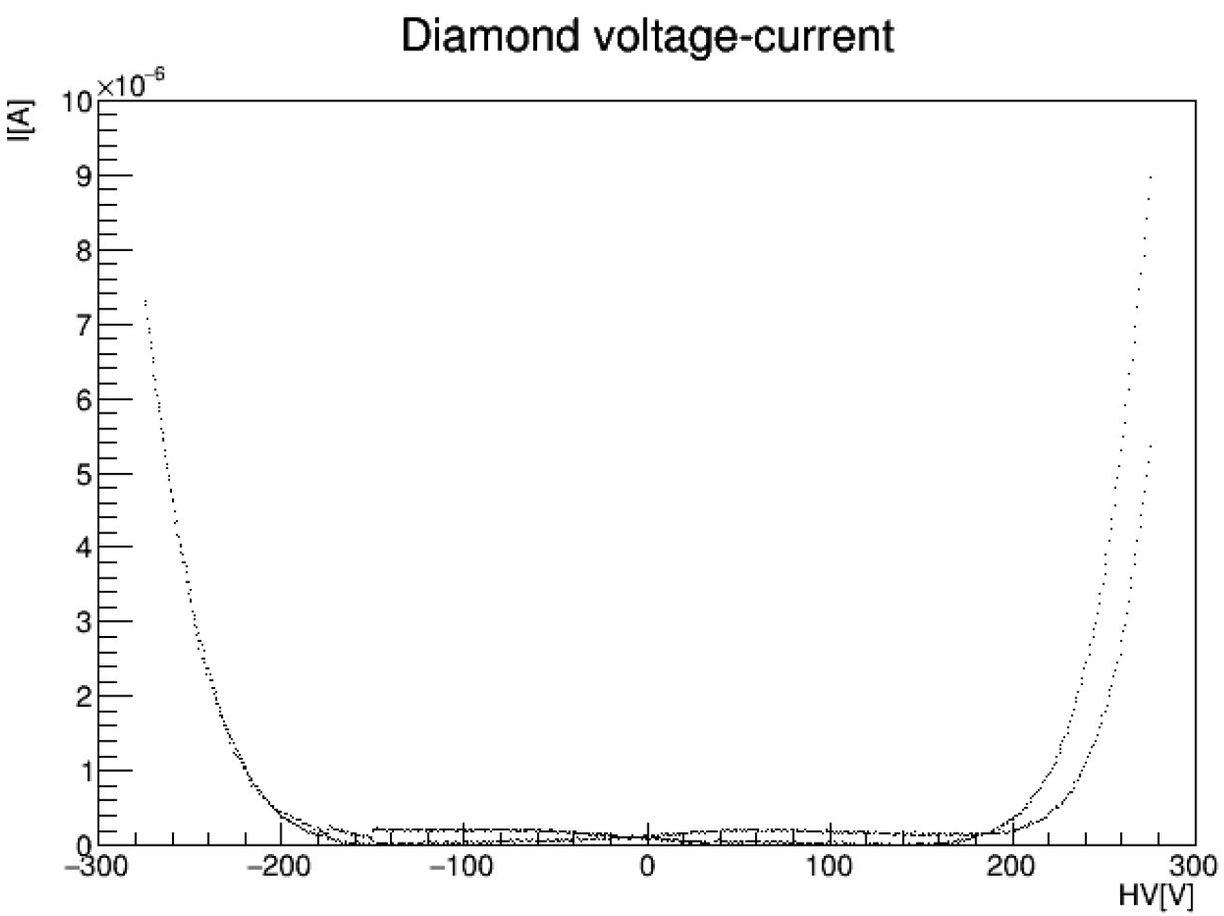
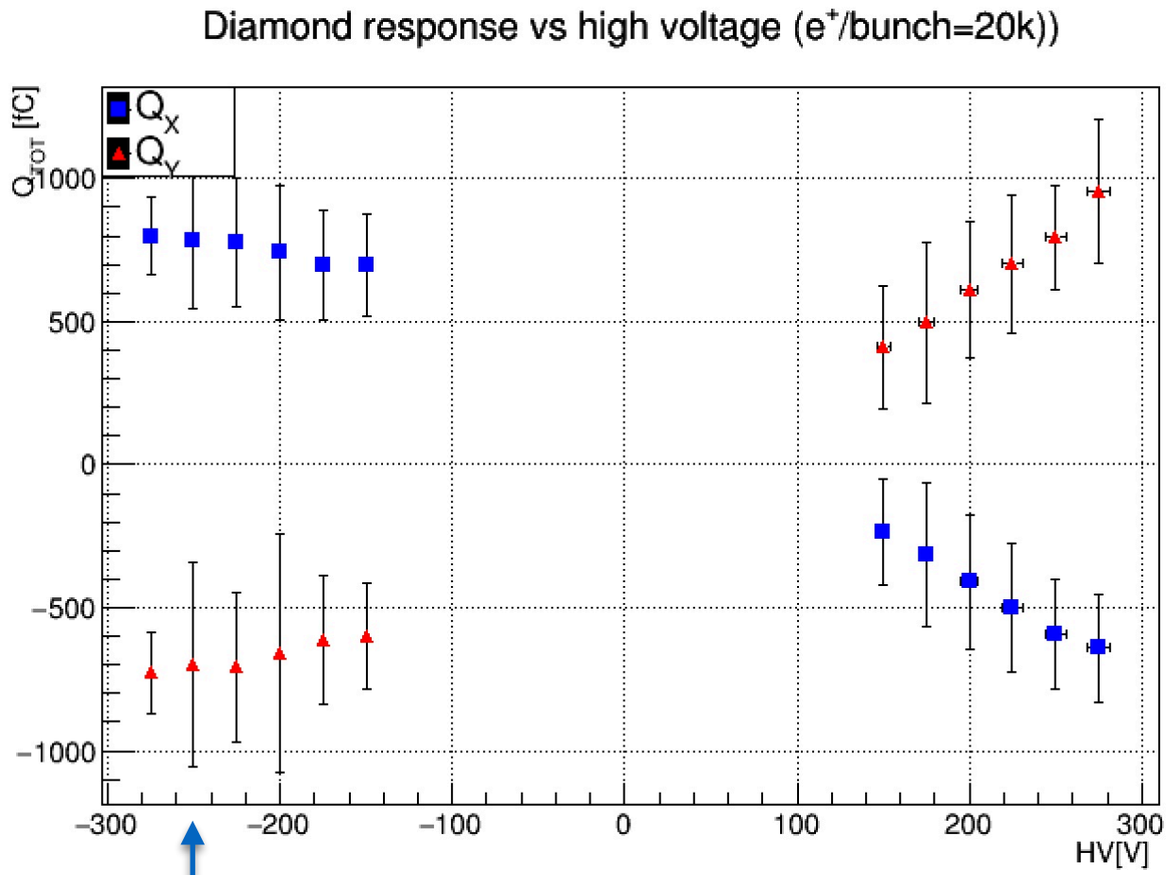
Target working point

IV curve

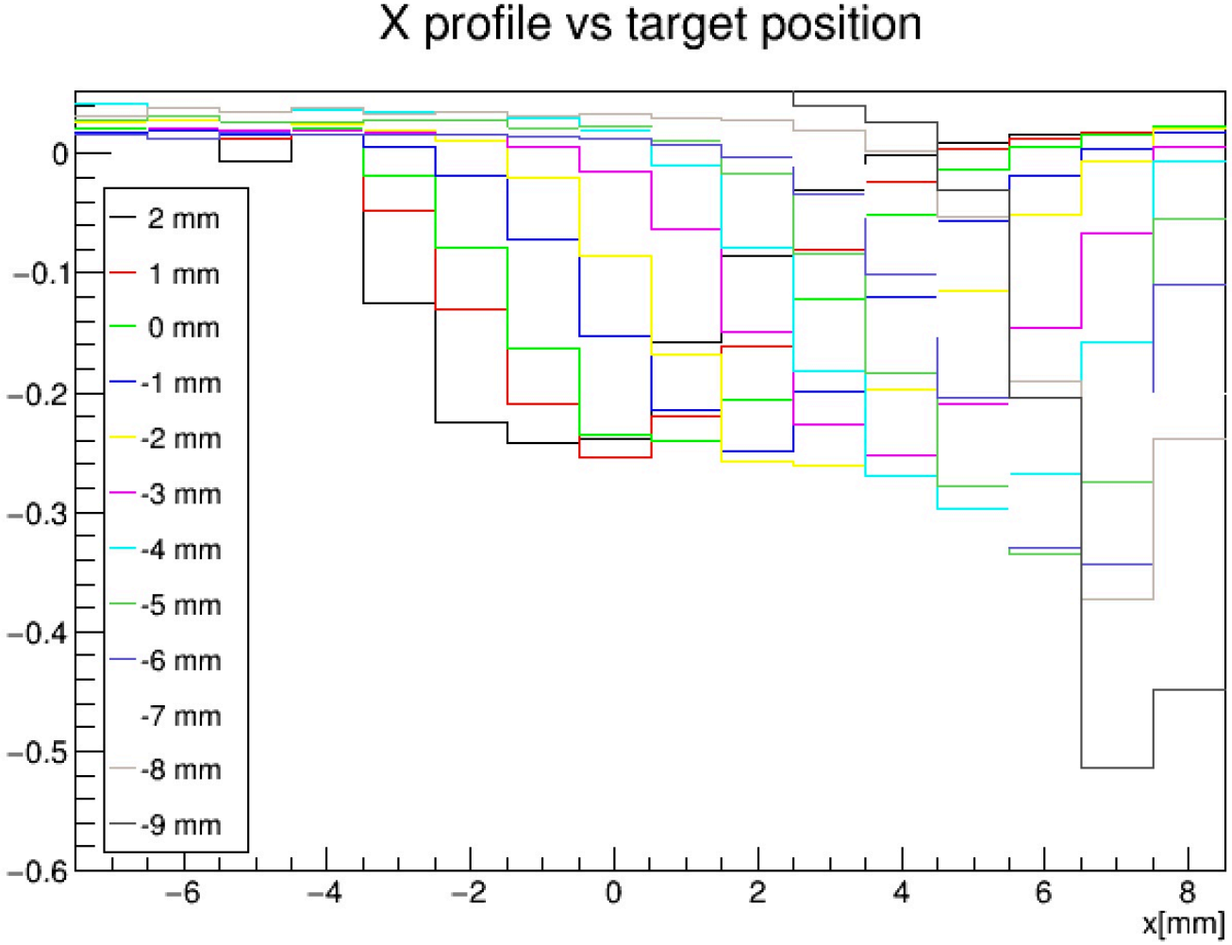


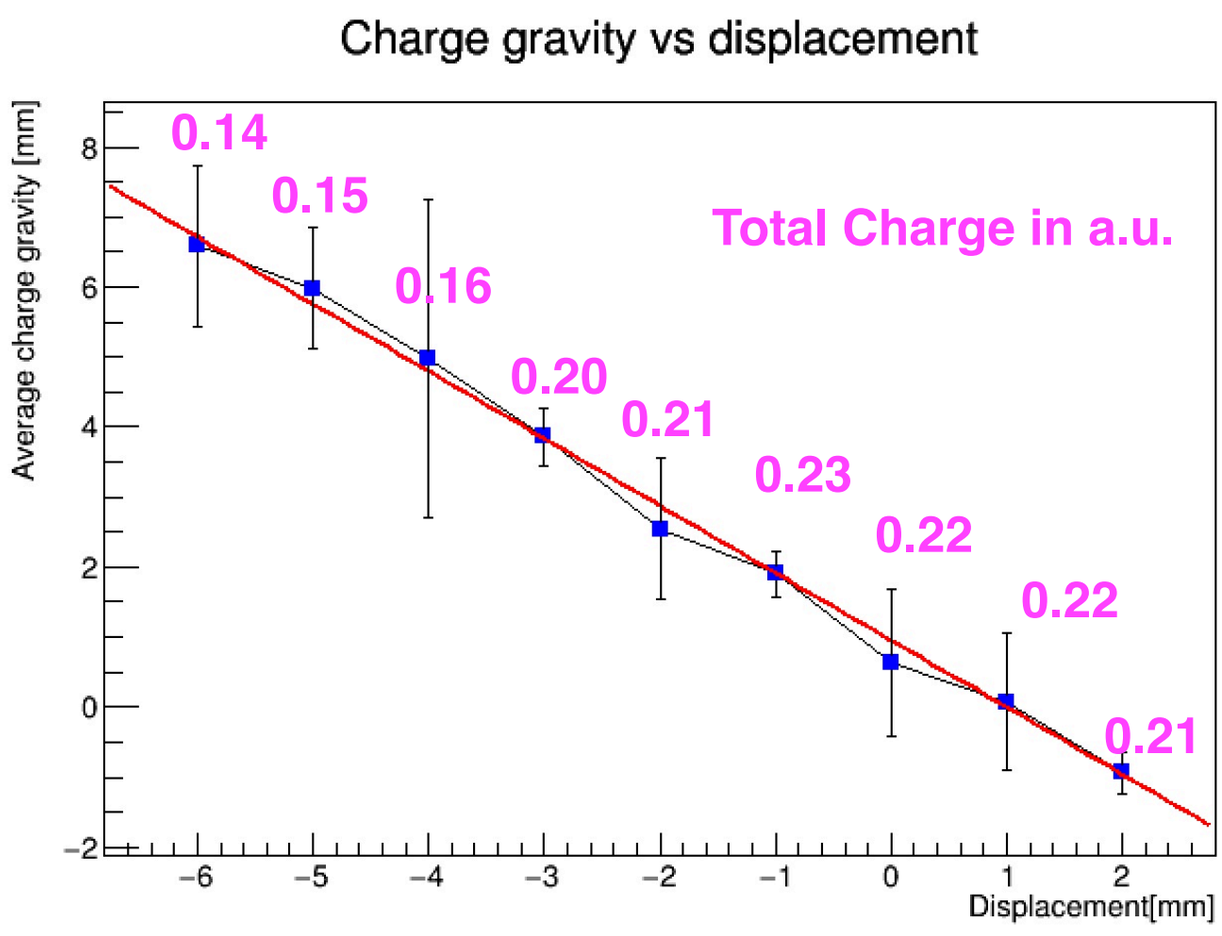
Total charge vs HV



HV=-250V
(for full data taking)

Target linearity

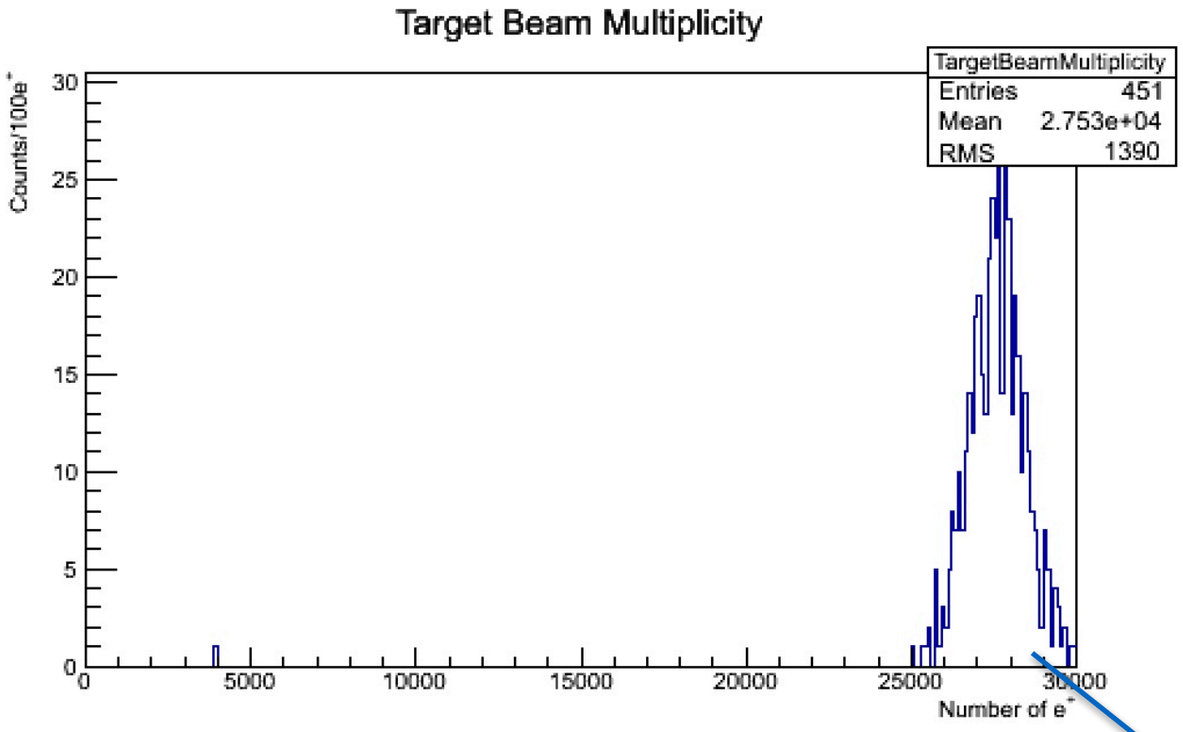




X beam position from gaussian fit to the 3 most populated strips vs X displacement

NB: channels not equalised

Multiplicity fluctuation



Multiplicity	rms	sqrt(Multiplicity)
5010	716	70
11470	834	110
18920	1330	130
27530	1390	165

Multiplicity fluctuation much higher than Poisson statistics:
Diamond noise? MIP fluctuations?

Outstanding questions

- How much is the average CCD
- How much is the local CCD fluctuation
- How much is the target intrinsic noise
- How much is the dynamic range

Required runs

- Pulse tests with PADME DAQ and BTF trigger delayed:
    - Channels equalisation and gain
    - Channels linearity and dynamic range
    - Channels noise
- Absolute calibration with beam fully contained by TimePix3
    - It is possible to tune the beam in such a configuration?
- Narrow beam spot on target and move target along X and beam along Y
    - 2D uniformity response