



EP-DT

Detector Technologies

Ecogas GIF+++ EP-DT

16 Apr 2019

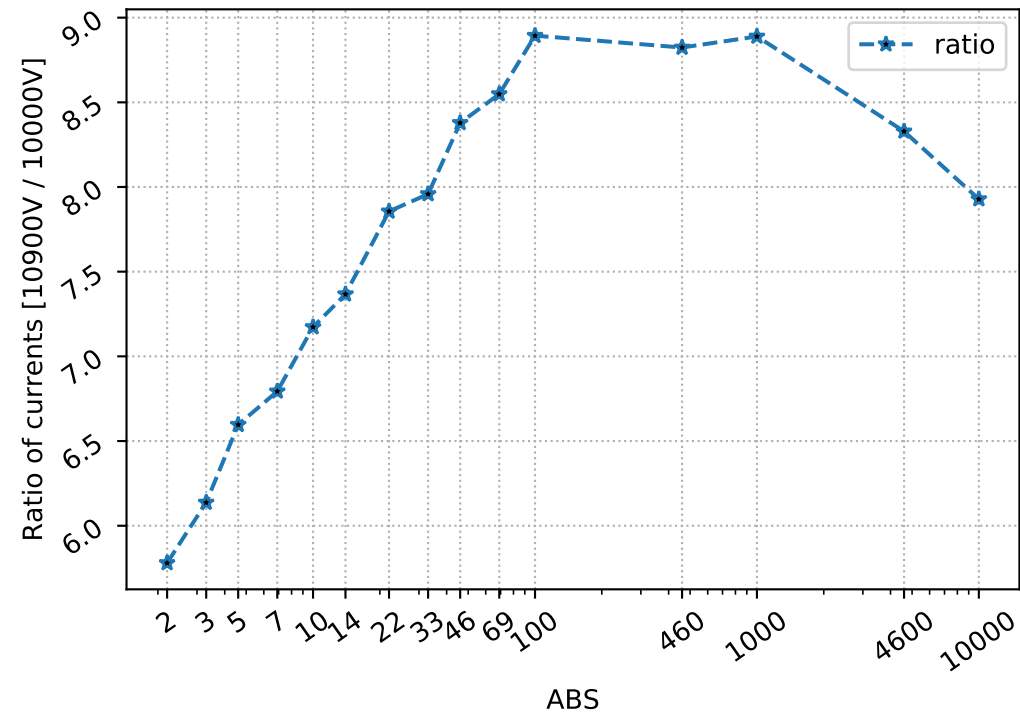
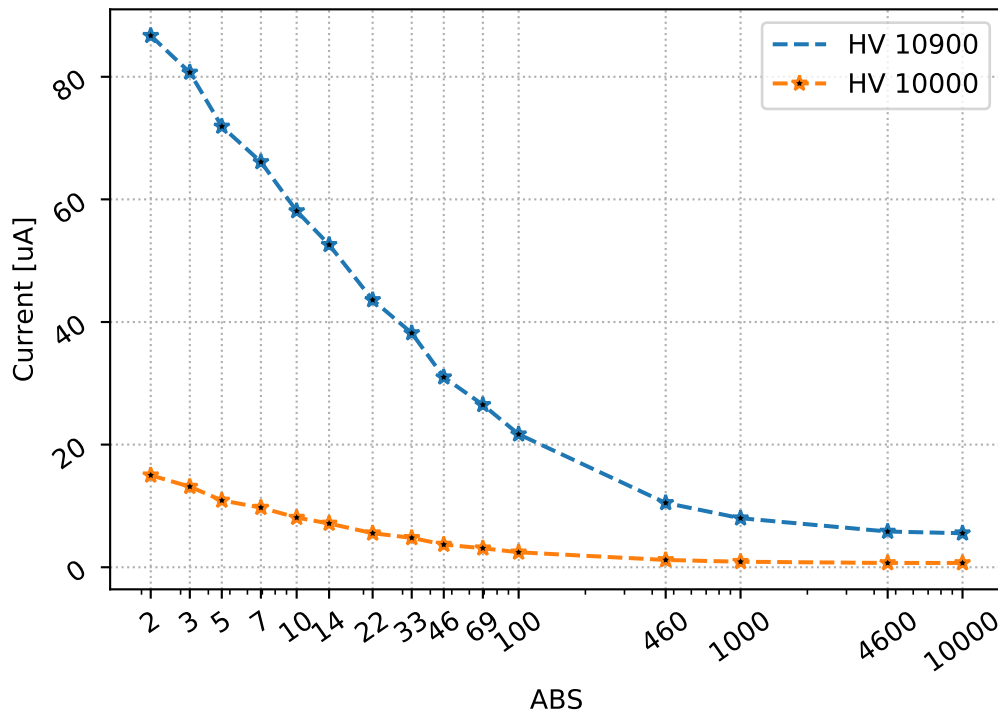
Summary of performed tests

→ HV scan at different filters

ABS	Standard mixture	HFO based mixture
OFF	8	11,12,24,25,28
6.9		26
10		28
22	9,10	23
46		27

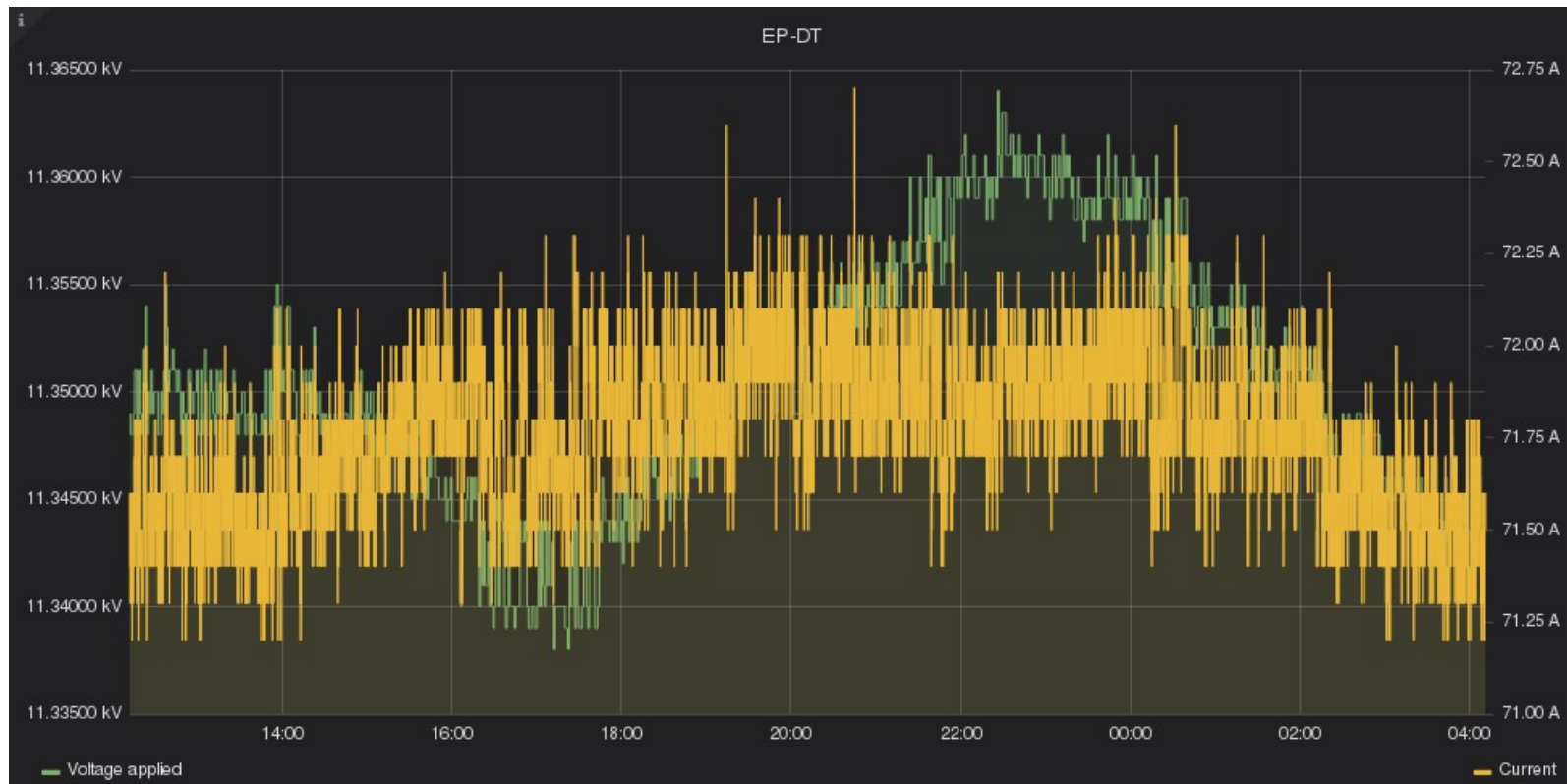
Summary of performed tests

- **Filter Scan** with HFO mixture:
- P, T = 959.5 mbar, 21.6° C
- **Manual** scan: HVapp = (working point 10900V, standby 10000V)



Summary of performed tests

- **Stability** with HFO mixture:
- **ABS 22**, H_{veff} 12600-12800V, duration = 5 days
- WEBDCS used to control H_{veff}
- Currents appear *to be stable*: ± 0.5 μA max fluctuation
- Screenshot: <https://epdt-rd-monitoring.web.cern.ch/d/pqvlTZRWz/global?orgId=1&from=1557655907000&to=1557713507000>



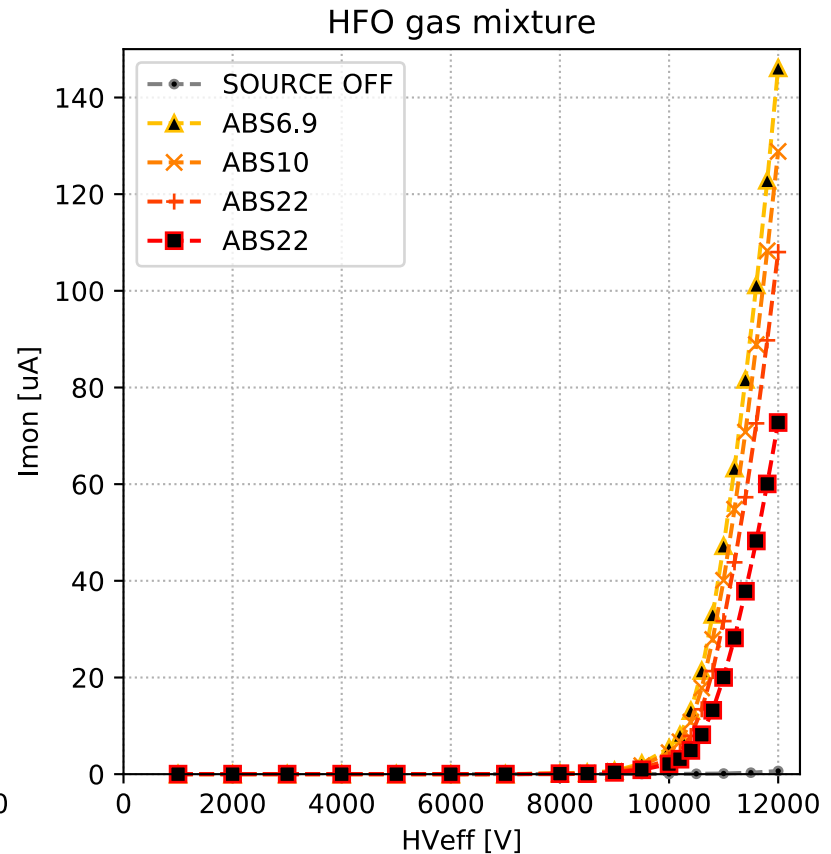
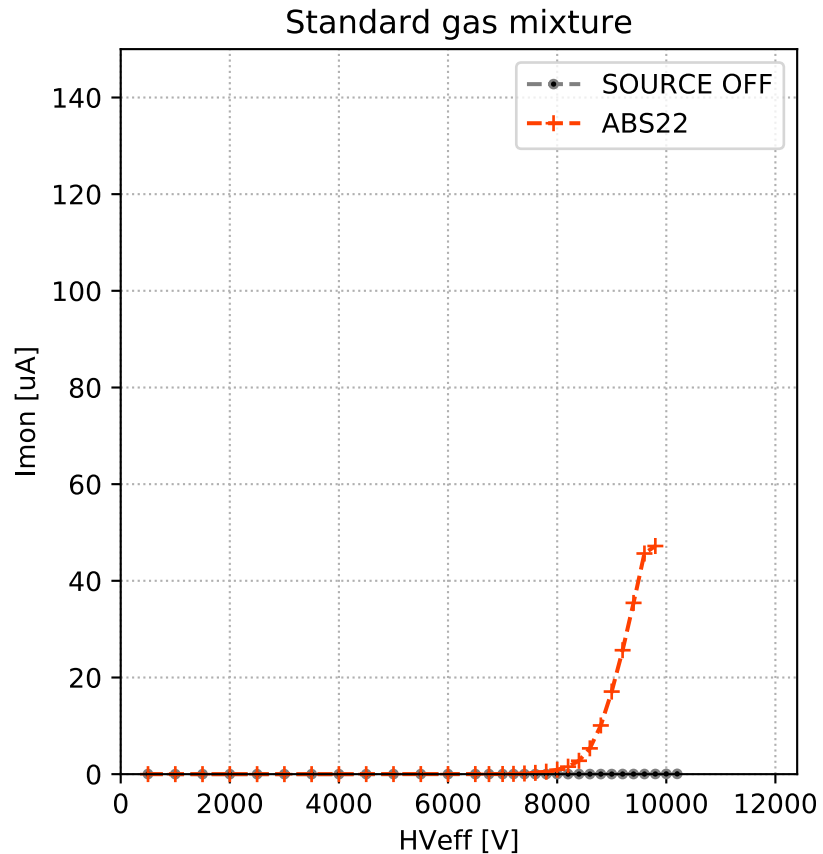
Summary of performed tests

- **Stability** with HFO mixture:
- **ABS 2.2**, H_{Veff} 11600V, duration = 2 nights so far
- WEBDCS used to control H_{Veff}
- Currents from 134 μ A to 141 μ A in ~2 hours. Then stabilized at 139
- Screenshot: <https://epdt-rd-monitoring.web.cern.ch/d/pqvlTZRWz/global?orgId=1&from=1558024618902&to=1558076596985&panelId=5&fullscreen>



HV Scans

- **Few points** for standard gas mixture
- HFO mixture: transition from dark to physics current at ~10500V
- STD mixture: transition from dark to physics current at ~8500V
- Estimation of Delta in knee between HFO and STD mixture



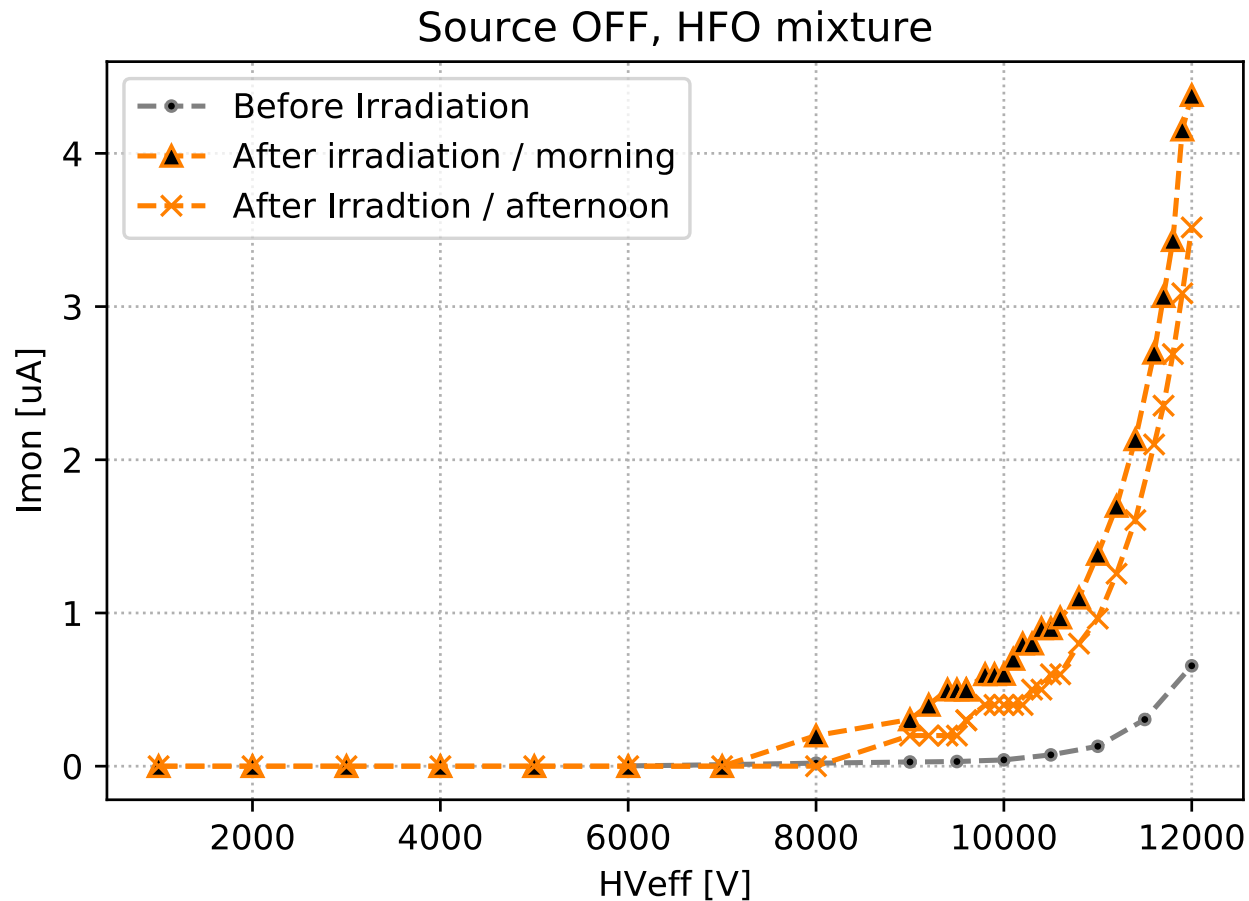
HV Scans

- Delta(SourceOFF) ~ 2400V
- Delta(ABS22) ~ 2100V
- Delta(SourceOFF) **after irradiation** ~ 2150V

scan	mixture	abs	knee
8	std	0	8648
9	std	22	8343
10	std	22	8373
11	hfo	0	11131
12	hfo	0	10911
23	hfo	22	10493
24	hfo	0	10821
25	hfo	0	10807
26	hfo	6.9	10605
27	hfo	46	10713
28	hfo	10	10627

HV Scans

- Comparison of source off with HFO before and after irradiation
- Results are quite interesting: **increase** of *dark* current and *physics* current
- Might be due also to **gap/frame issues**



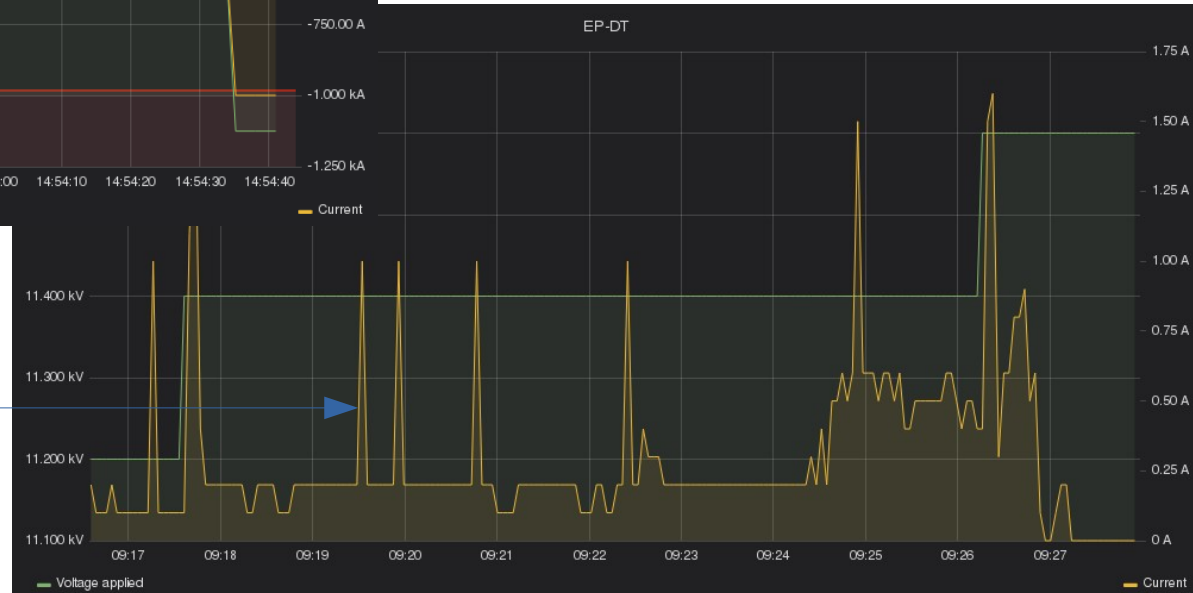
Gap Issues

- During source scan EPDT-RPC3 chamber had a **spike** and switched off the hv module
- Turned out to be the **HV connector** from gap side. The connector has been fixed
- However, the chamber has now some **small discharges** between gap and frame



Current spiked to over 200uA

Current wasn't stable after reparation with source off



Conclusions

Summary:

- Something happened to the detector with hfo after irradiation. We need to collect more data from next weeks
- To think about **changing flow** of each single chamber
- To think about what **parameters** we should **monitor**
- To think about the setup for **rate measurements**

Requests:

- Filter scan 22 (so it can be compared with our first source scan)
- Repeat scans 46, 6.9, 2.2 until 12kV

Others:

- HVeff, current and flow history available on **grafana**: data is logged every **2 seconds**. Link: <https://epdt-rd-monitoring.web.cern.ch/d/pqvlTZRWz/global?orgId=1&from=now-15m&to=now&panelId=5&refresh=1m>
- Data in **.csv** format of **webdcs** for scans ids 8,9,10,11,12,13,23,24,25,26,27,28: <https://cernbox.cern.ch/index.php/s/HjvchUv3LOXwj90>
- Bottle of HFO is expected to be over around Monday at current flow (5 ln/h):

HFO flow	Tot flow	Vol/h per gap	Duration bottle
3 ln/h	6.7 ln/h	< 1	31 days
4 ln/h	8.9 ln/h	~1	23 days
5 ln/h	11.1 ln/h	> 1	18-19 days