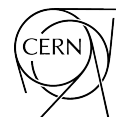


Ecogas ISE measurements

G. Rigoletti



EP-DT
Detector Technologies



Outline

- ISE measurements

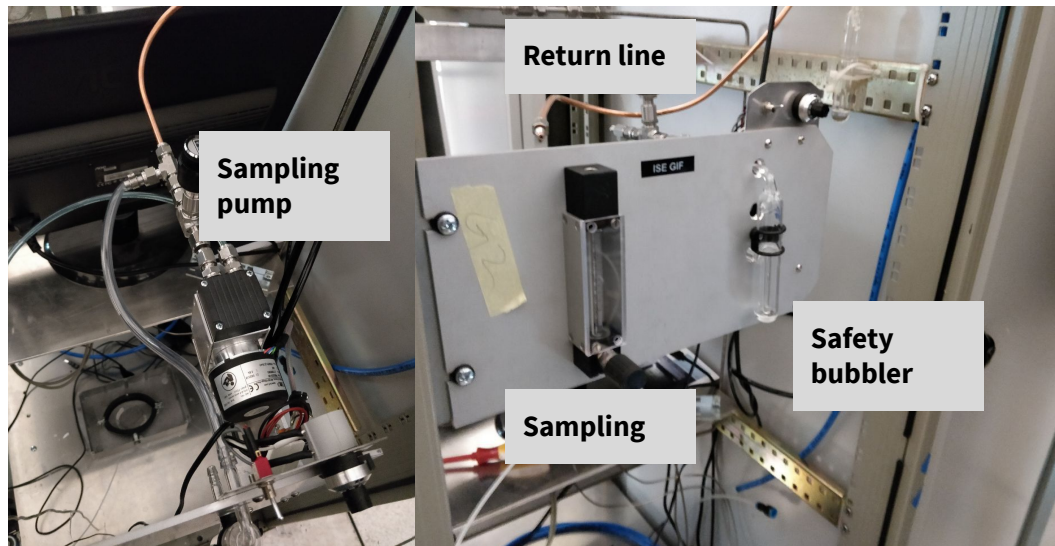
Setup ISE

Setup:

- **CMS-GT** chamber
- **Ion Selective Electrodes (ISE)**
- **ISE station** data reading and logging
- **Custom gas panel** for ISE sampling

Steps:

- Electrodes calibration in lab
- Exhaust connected to gas room
- Gas sent only to CMS-GT ~ 1 vol/h
- ISE pump on + sampling flow 0.5 l/h
- Continuous measure of 2.5 hours $\rightarrow$ rate interpolation



Results

Detectors parameters:

- **Gas:** 1 vol/h
- **HV:** 10.6 kV
- **ABS:** 6.9
- Data taken reported in elog:
<https://rpcecgas.web.cern.ch/rpcecgaselog/150>

Results:

- **Currents:** 118-124 uA
- **Current density:** 0.017 uA/cm²
- **F⁻ rate ~ 30 umol/h**

time (PM)	ppm	umol	Rate Increase (uA)
02:42:38 AM	0.0	0.7	
02:45:08 AM	0.0	0.6	-1.4
02:50:38 AM	0.0	0.5	-1.1
02:55:38 AM	0.0	0.5	-0.7
03:01:38 AM	0.0	0.4	-0.5
03:06:08 AM	0.0	0.4	-0.4
03:11:38 AM	0.4	5.7	58.0
03:21:08 AM	1.0	16.6	69.0
03:31:38 AM	1.2	20.2	20.5
03:37:08 AM	1.4	22.1	21.2
03:42:08 AM	1.5	23.9	21.0
03:47:08 AM	1.6	25.6	20.2
03:52:38 AM	1.7	27.6	22.0
03:57:38 AM	1.8	29.4	21.9
04:02:38 AM	1.9	31.2	21.8
04:08:08 AM	2.1	33.4	24.0
04:13:08 AM	2.2	35.4	23.1
04:18:38 AM	2.3	37.9	27.1
04:23:38 AM	2.5	40.0	26.2
04:28:38 AM	2.6	42.2	25.6
04:39:08 AM	2.9	47.2	54.5
04:44:08 AM	3.1	49.9	32.6
04:50:08 AM	3.3	53.0	30.8
04:58:08 AM	3.5	56.7	28.0
05:03:38 AM	3.7	59.2	27.8
05:08:38 AM	3.8	61.7	29.0
05:13:38 AM	4.0	64.2	30.2
05:18:38 AM	4.1	67.1	34.6

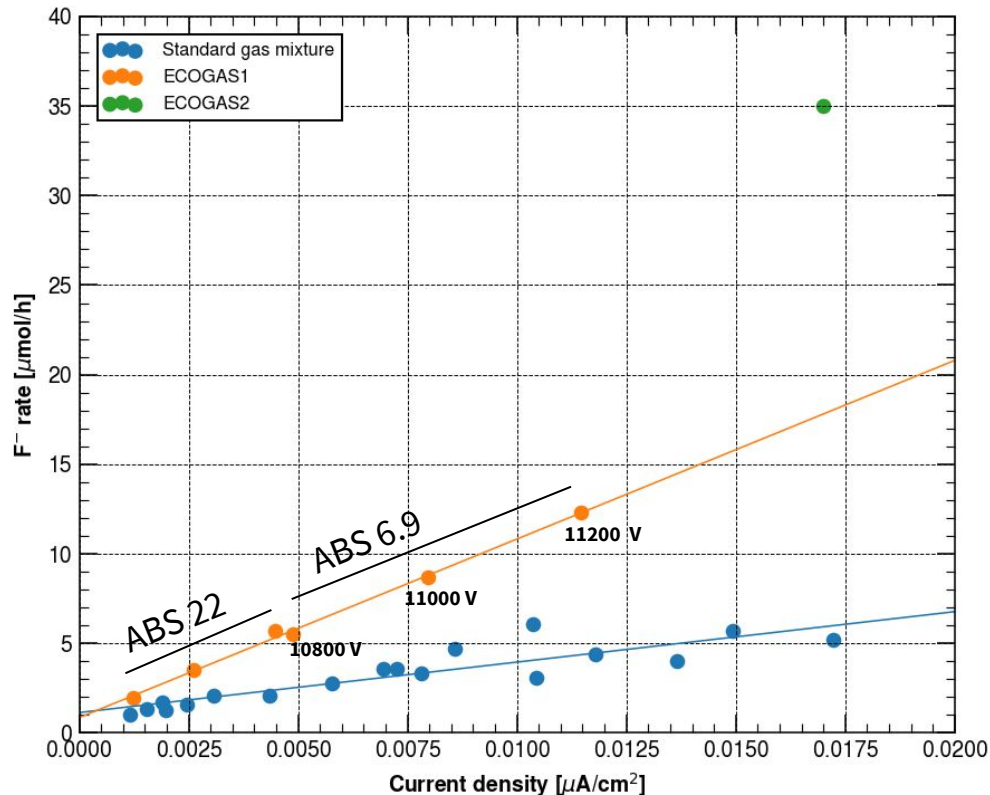
Comparison

Detectors parameters:

- **Gas:** 1 vol/h
- **HV:** 10.6 kV
- **ABS:** 6.9
- Data taken reported in elog:
<https://rpcecogas.web.cern.ch/rpcecogaselog/150>

Results:

- **Currents:** 118-124 $\mu\text{A/gap}$
- **Current density:** $0.017 \mu\text{A/cm}^2$
- **F⁻ rate** ~ 30 $\mu\text{mol/h}$



From Andrea's presentation

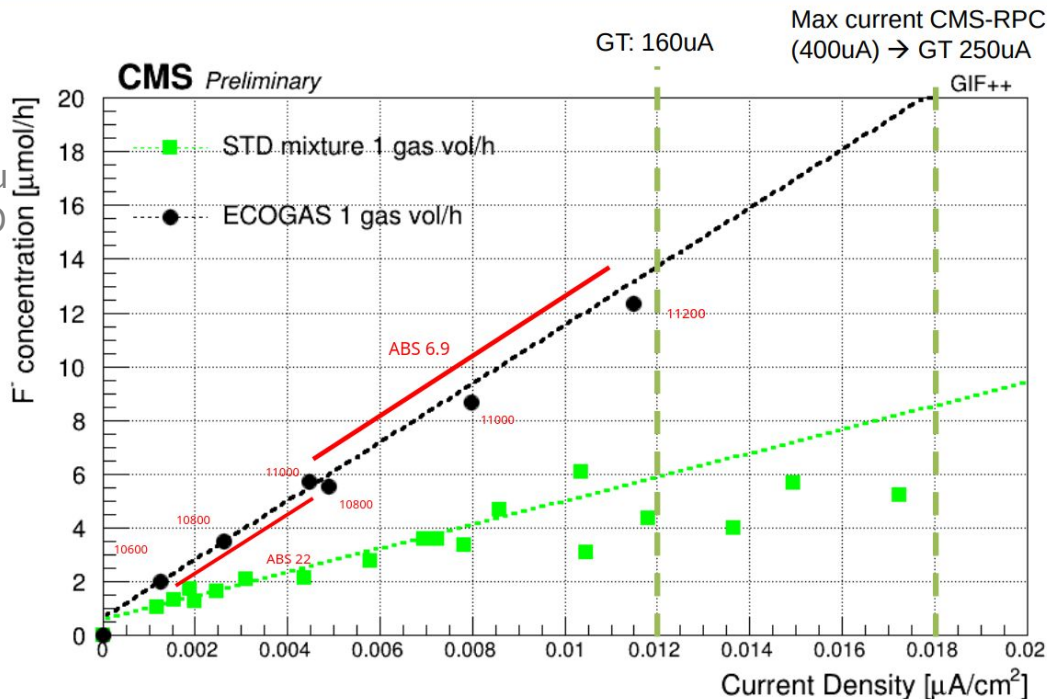


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- Max HV: 11.2 kV ~ 10.2 kV of ECO2

Link to presentation:

https://agenda.infn.it/event/19253/contributions/90333/attachments/63079/75866/ECOGAS_HFstudy.pdf



- ✓ The HF concentration depends linearly by the current
- ✓ Ecogas slope: 1.09137×10^3 STD mix slope: 4.42870×10^2
- ✓ HF concentration: factor 2.5 higher with ecogas