

# Week 23 - R&D Activities

Status - Week 03.06.2024 - 07.06.2024

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EP-DT  
Detector Technologies

# LAB256

## Updates

- R-134a bottle has finished -> we ordered a new one.
- There was an intervention on the air conditioning system yesterday evening, I will check today if it was fine as the temperature reached 25°C.

# RPC

## Updates

- RPCs 17, 18, 19, 21 and 22 are ready to be moved at GIF++.
- They were tested with the Standard Gas Mixture, the 30% CO<sub>2</sub> + 1% SF<sub>6</sub> and 30% CO<sub>2</sub> + 0.5% SF<sub>6</sub>.
- RPC 18 was also tested with the pad -> it shows very low rates all throughout the detector surface (max. ~20Hz/cm<sup>2</sup>).

Standard Gas Mixture

RPC	MaxEff [%]	WP [kV]	StProb [%]	Currents @WP [μA]	Location
17	95.5	9.6	2.5	14	600hZ/cm <sup>2</sup>
18	96.0	9.5	1.0	0.4	600hZ/cm <sup>2</sup>
19	95.7	9.5	0.4	27	100hZ/cm <sup>2</sup>
21	95.1	9.5	0.5	0.25	600hZ/cm <sup>2</sup>
22	94.0	9.8	2.3	1.1	PA

30% CO<sub>2</sub> + 1% SF<sub>6</sub>

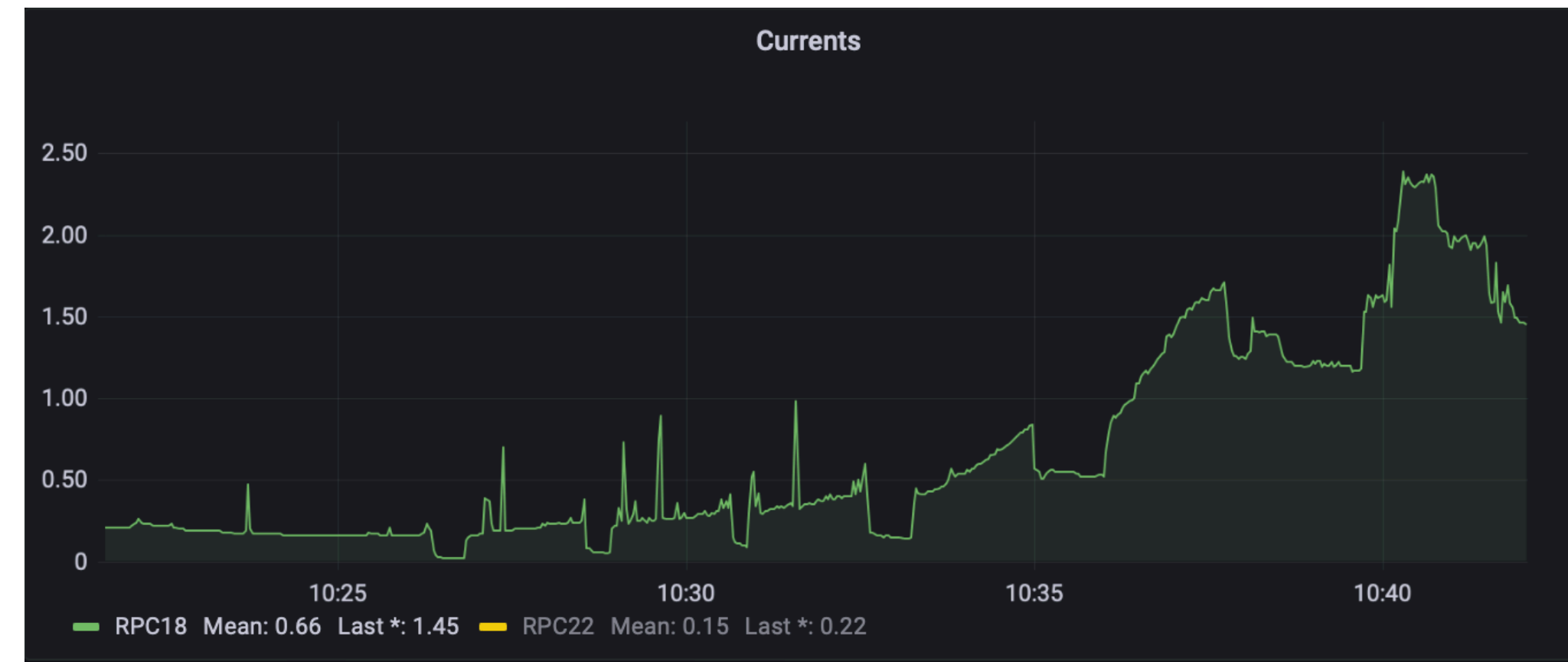
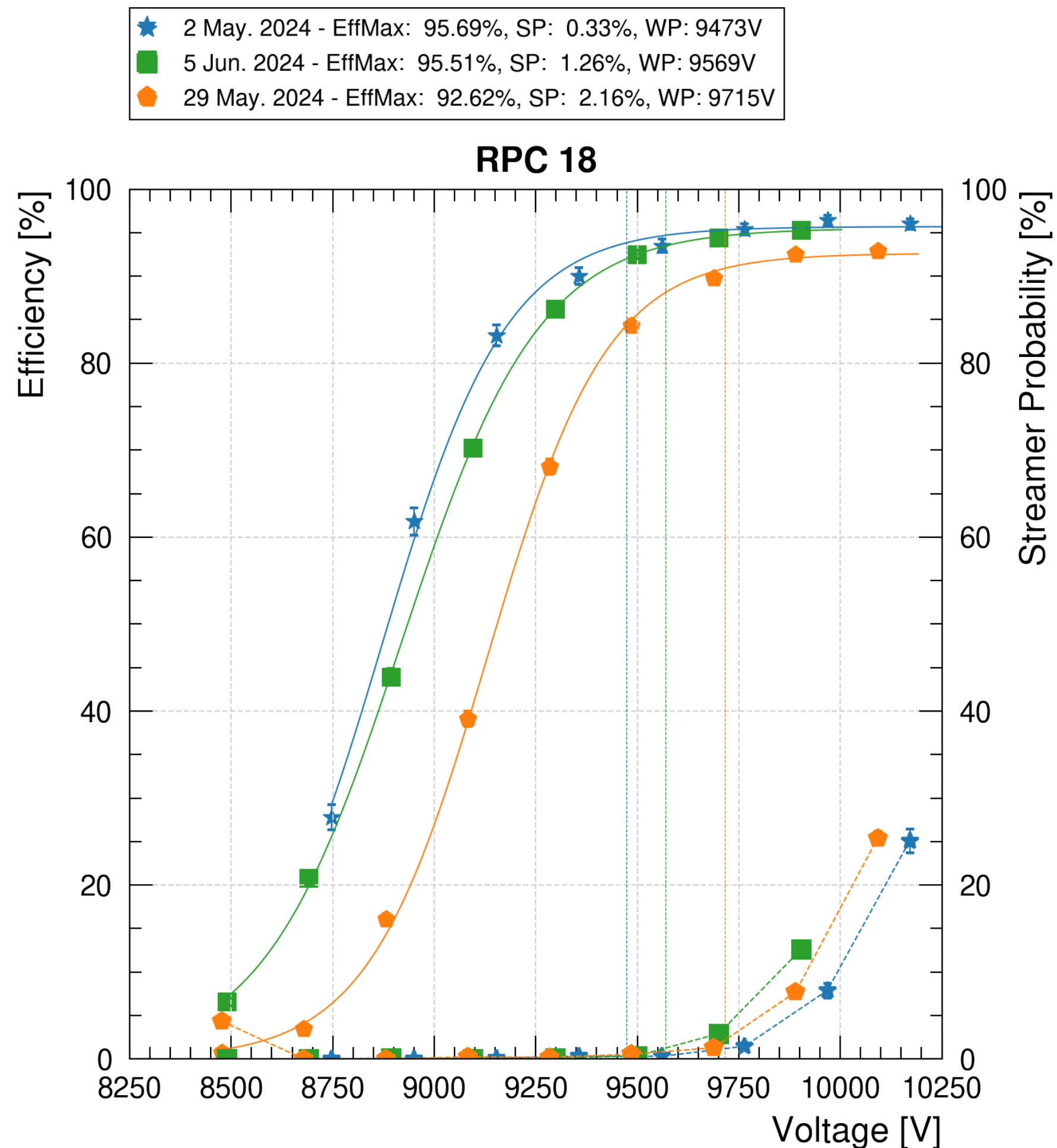
RPC	MaxEff [%]	WP [kV]	StProb [%]	Currents @WP [μA]	Location
17	94.7	9.4	10	15	600hZ/cm <sup>2</sup>
18	92.2	9.5	11.8	4	600hZ/cm <sup>2</sup>
19	95.1	9.3	1.2	27	100hZ/cm <sup>2</sup>
21	94.9	9.3	2.2	0.3	600hZ/cm <sup>2</sup>
22	96.3	9.5	10.0	0.85	PA

30% CO<sub>2</sub> + 0.5% SF<sub>6</sub>

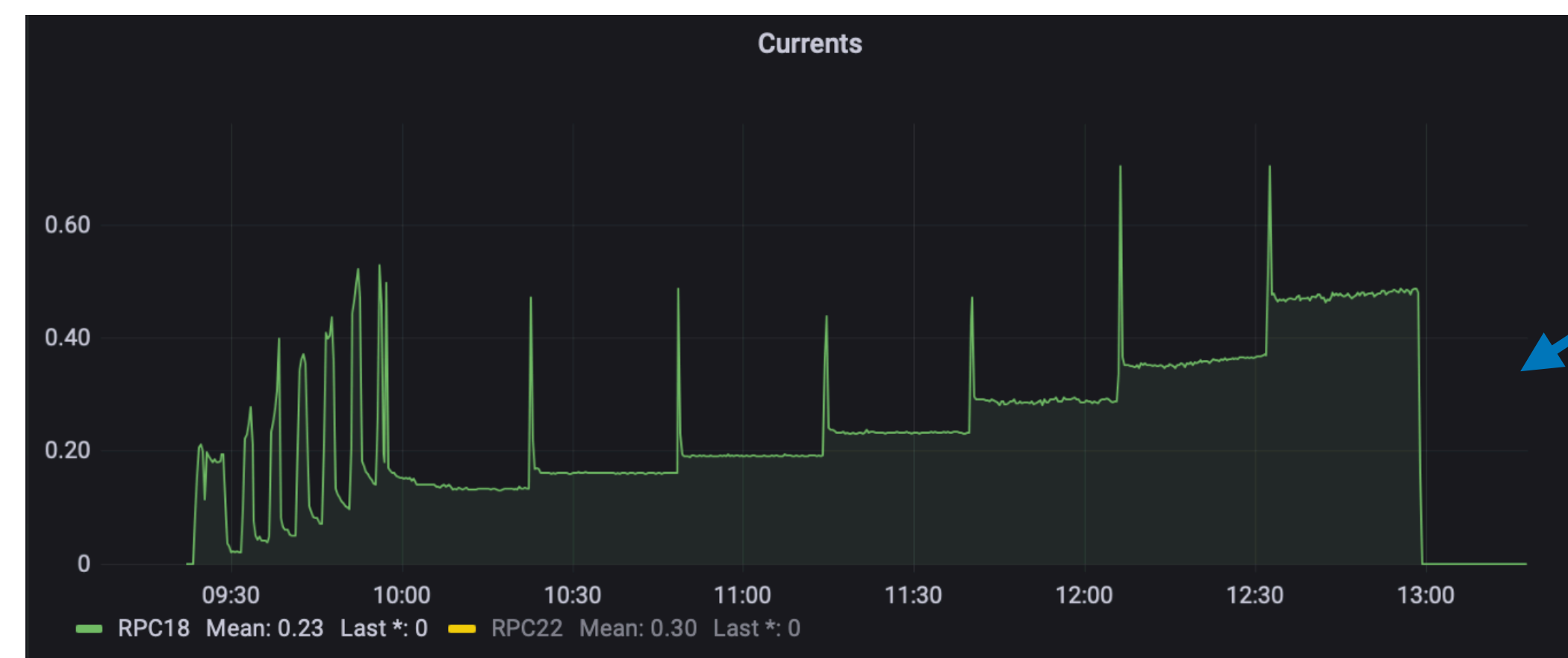
RPC	MaxEff [%]	WP [V]	StProb [%]	Currents @WP [μA]	Location
17	94.5	9.2	12.3	14	600hZ/cm <sup>2</sup>
18	91.1	9.3	16.2	0.6	600hZ/cm <sup>2</sup>
19	95.3	9.0	2.5	23	100hZ/cm <sup>2</sup>
21	93.9	9.0	2.9	0.2	600hZ/cm <sup>2</sup>
22	95.3	9.2	11.4	0.65	PA

# RPC Updates

- For RPCs 18 and 22, that were initially tested with different frames.
- So, when tested again in new frames, they showed problems in the currents and lower efficiency.
- We decided to swap the frames of RPCs 18 and 22 and leave RPC 18 opened (except for the ground)



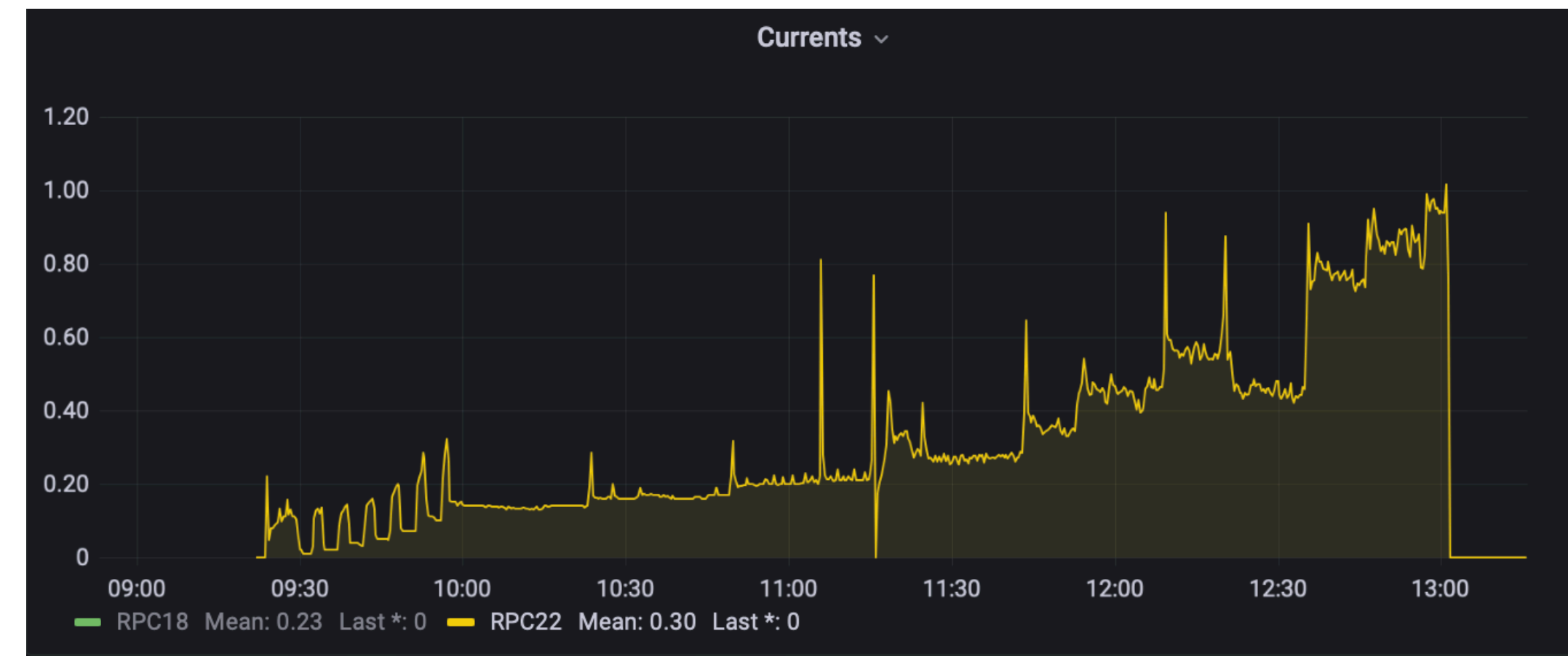
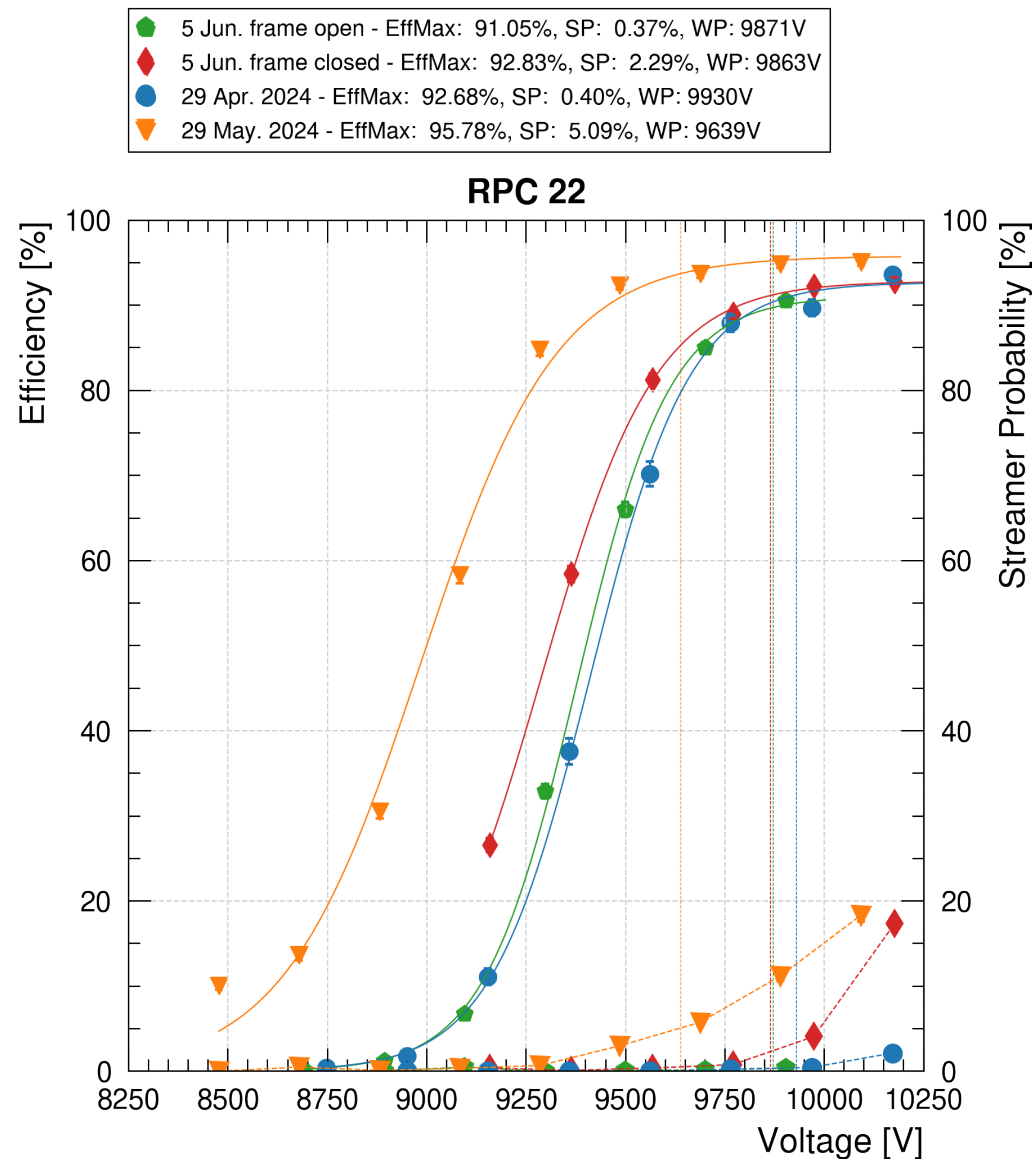
Swapping its frame and leaving it open



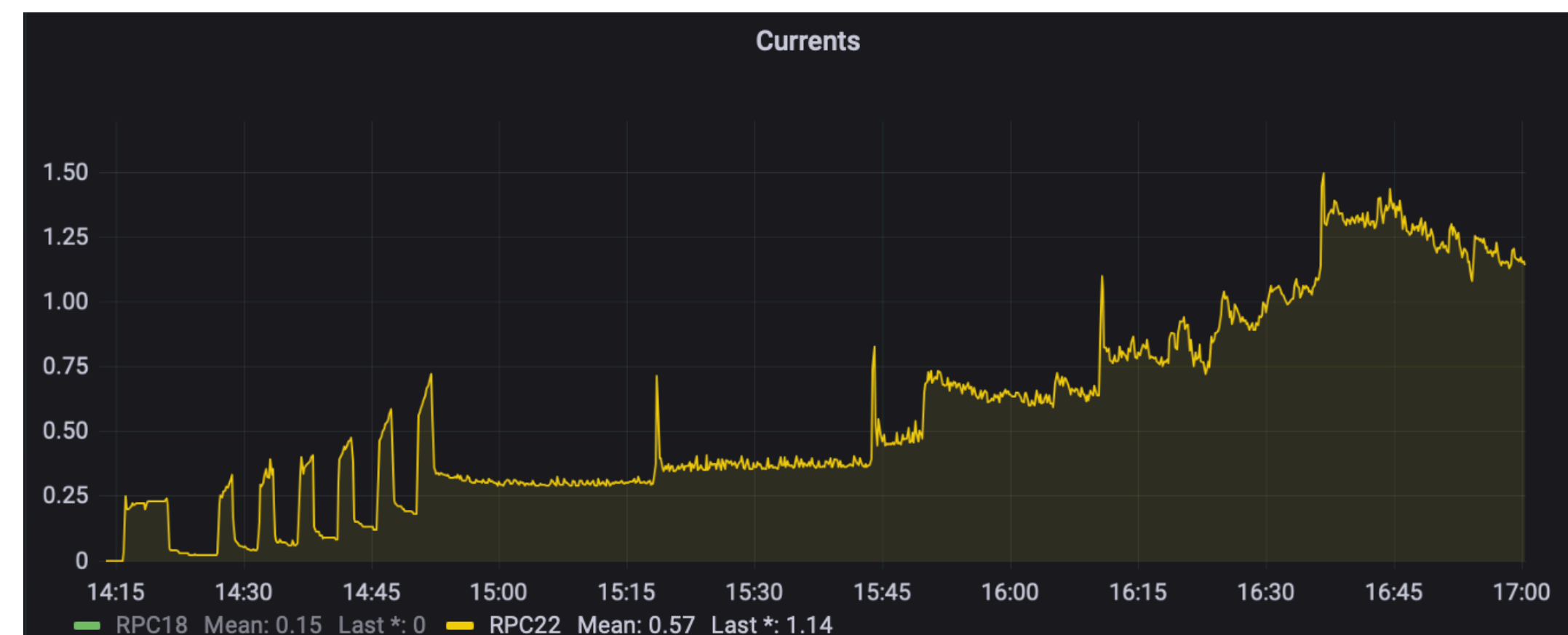
RPC 18 looks like its was too compressed.

# RPC Updates

- RPC 22 shows more stable currents with the frame closed at lower voltages and the efficiency is similar to when it was being used in its own frame.



Closing its frame



RPC 22 looks like its was not compressed enough.

# Next Tests

## Updates

- Taking the RPCs to GIF, however from Monday 10.06 to Wednesday 12.06, there are works on the flooring, so we need to discuss with Giuseppe.
- Install RPCs 12, 14, 26 in the 'pizzeria' and start testing new mixtures.
- What gas to start with?

Gas	# Bottles
Air	1
Amoleea-1224yd	1
Ar	1
Ar + CO2 30%	1
Ar + CO2 7%	1
CF3I	3
CO2	1
CO2 + 500pm O2	1
CO2 + Ne	1
He	2
He + 100ppm O2	1
N2O	1
Ne	1
NOVEC4710	3 (1 from China)
NOVEC5110	2 (1 from China)
PFG-5040	1
R-1233zd	1
R-1234ze	4
R-1336mz	1
R-134a recovered	1
R-14	1
R-154a	1
R-236ea	1
R-236fa	1
R-245fa	1
R-404a	1
SF6	1
Ar + 40% R14 + 15% CO2	1