

# Ecogas RPC 26 current study

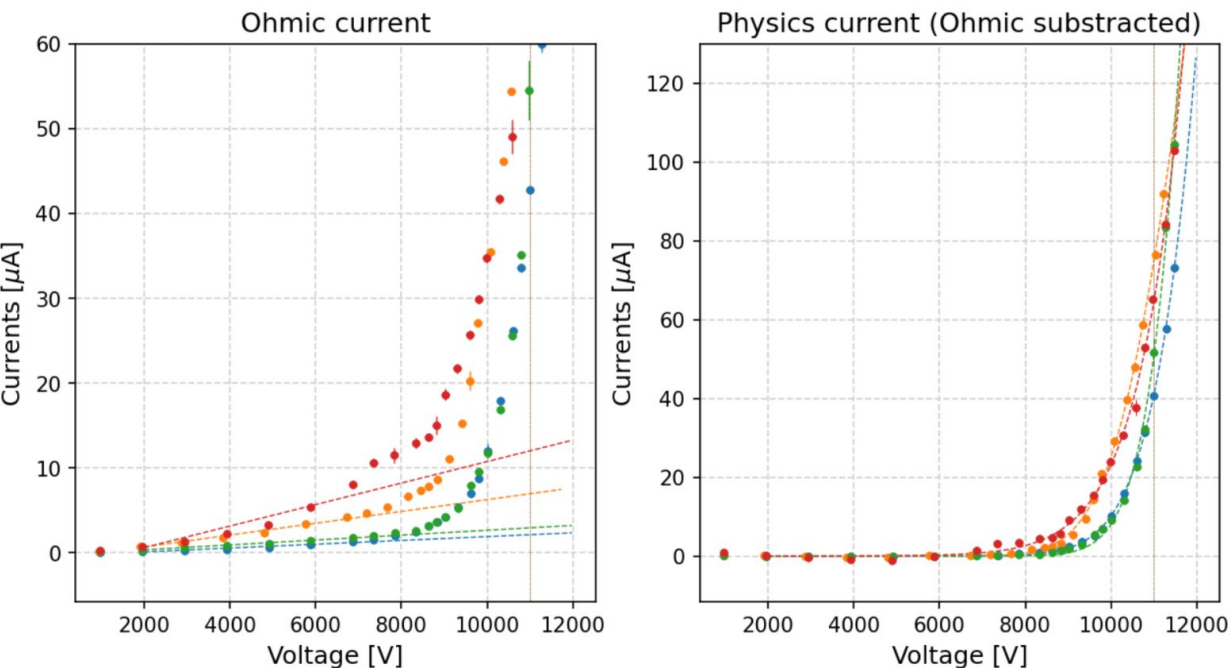
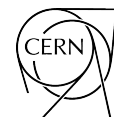
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ECOGAS@GIF++ COLLABORATION



EP-DT  
Detector Technologies

# Current scan (after 01.2025)



Off  
9 kV  
Christmas

|     |  |
|-----|--|
| ●   | RPC EPDT-RPC25, 2025-03-19 13:38<br>ECO2,1020, Int. Charge: 179.3 mC/cm <sup>2</sup> |
|     | Physics Fit  |
|     | Ohmic @WP: 2.11 $\mu\text{A}$  |
| --- | Ohmic @6kV: 0.98 $\mu\text{A}$   |
|     | Physics @WP: 41.1 $\mu\text{A}$  |
|     | Physics + Ohmic @WP: 43.2 $\mu\text{A}$  |
| ●   | RPC EPDT-RPC25, 2025-03-12 11:07<br>ECO2,1018, Int. Charge: 179.1 mC/cm <sup>2</sup> |
|     | Physics Fit  |
|     | Ohmic @WP: 6.94 $\mu\text{A}$  |
| --- | Ohmic @6kV: 3.45 $\mu\text{A}$   |
|     | Physics @WP: 75.05 $\mu\text{A}$   |
|     | Physics + Ohmic @WP: 81.99 $\mu\text{A}$   |
| ●   | RPC EPDT-RPC25, 2025-03-05 13:38<br>ECO2,1016, Int. Charge: 178.4 mC/cm <sup>2</sup> |
|     | Physics Fit  |
|     | Ohmic @WP: 2.92 $\mu\text{A}$  |
| --- | Ohmic @6kV: 1.48 $\mu\text{A}$   |
|     | Physics @WP: 51.21 $\mu\text{A}$   |
|     | Physics + Ohmic @WP: 54.13 $\mu\text{A}$   |
| ●   | RPC EPDT-RPC25, 2024-11-28 13:14<br>ECO2,1009, Int. Charge: 177.4 mC/cm <sup>2</sup> |
|     | Physics Fit  |
|     | Ohmic @WP: 12.0 $\mu\text{A}$  |
| --- | Ohmic @6kV: 5.66 $\mu\text{A}$   |
|     | Physics @WP: 64.75 $\mu\text{A}$   |
|     | Physics + Ohmic @WP: 76.75 $\mu\text{A}$   |

Current up & down even if detector kept at 9 kV:

-> Difference in the total time with the detector on between the scans

Need to consider the time in minutes for each voltages the week before the scan

|    | V_interval_end | Total_time_min | wp_current | ohmic_current |
|----|----------------|----------------|------------|---------------|
| 0  | 1000.0         | 663            | 64.876038  | 1.684081      |
| 1  | 2000.0         | 12             | 64.876038  | 1.684081      |
| 2  | 3000.0         | 11             | 64.876038  | 1.684081      |
| 3  | 4000.0         | 11             | 64.876038  | 1.684081      |
| 4  | 5000.0         | 9              | 64.876038  | 1.684081      |
| 5  | 6000.0         | 14             | 64.876038  | 1.684081      |
| 6  | 7000.0         | 16             | 64.876038  | 1.684081      |
| 7  | 8000.0         | 22             | 64.876038  | 1.684081      |
| 8  | 9000.0         | 595            | 64.876038  | 1.684081      |
| 9  | 10000.0        | 59             | 64.876038  | 1.684081      |
| 10 | 11000.0        | 19             | 64.876038  | 1.684081      |
| 11 | 12000.0        | 10             | 64.876038  | 1.684081      |

Example of the time computation for 1d before the scan, from which the wp\_current and ohmic\_current (6kV) are extrapolated

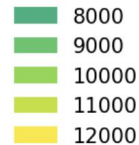
This operation is then repeated considering 2 days, 3 days, 4 days...7 days before the scan

The results are then plotted in an histogram, with the current values on the x-axis

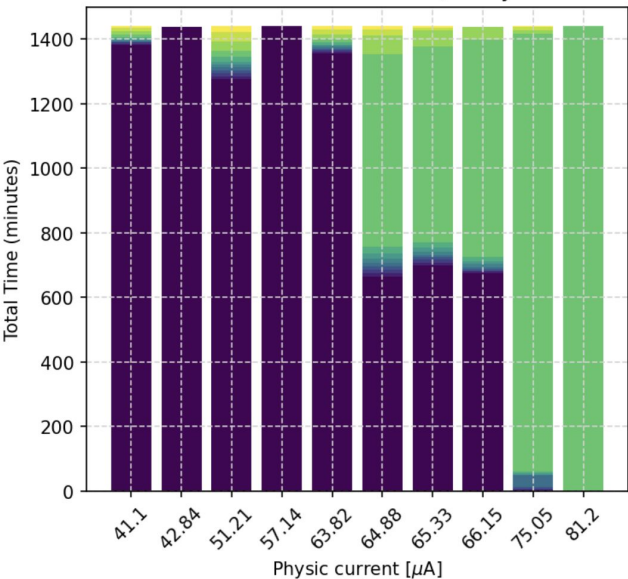
I've considered all the scan starting from beginning of 2025

# Results for EP-DT

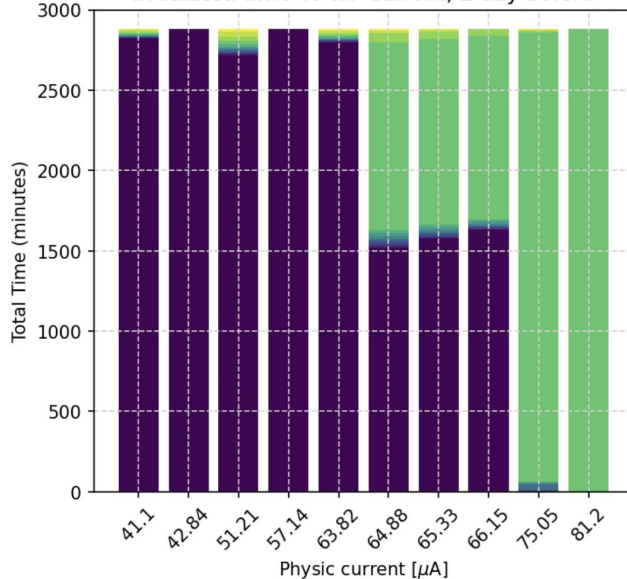
Voltage Interval (V)



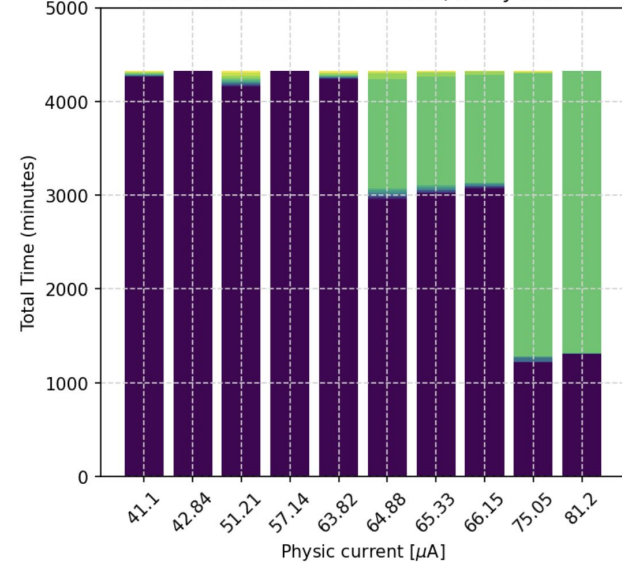
Irradiated time vs WP current, 1 day before



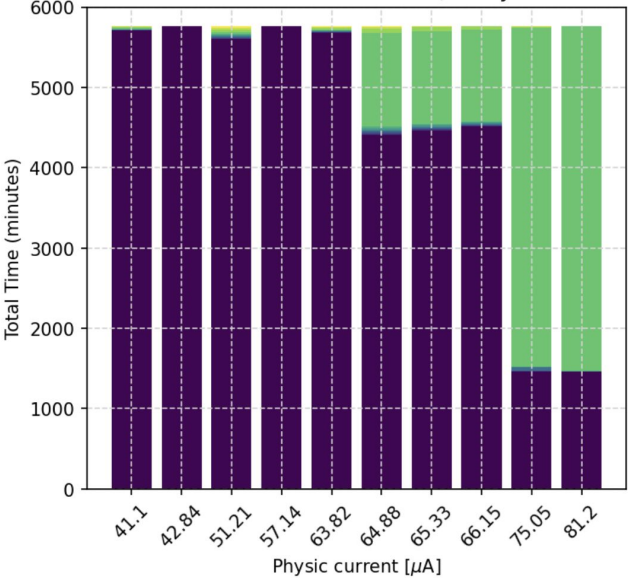
Irradiated time vs WP current, 2 day before



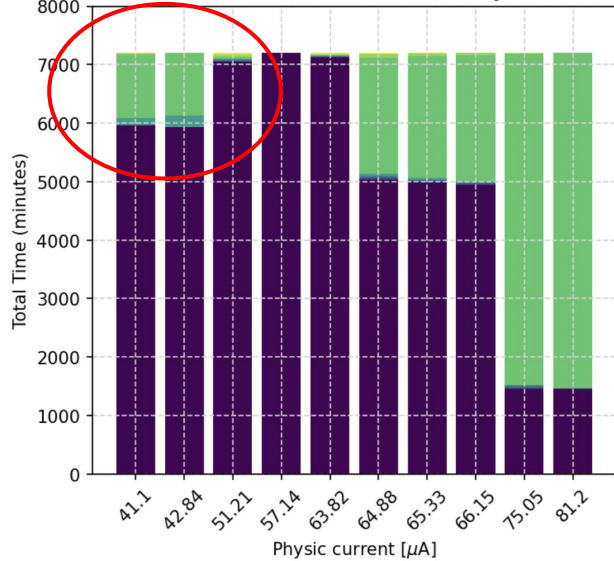
Irradiated time vs WP current, 3 day before



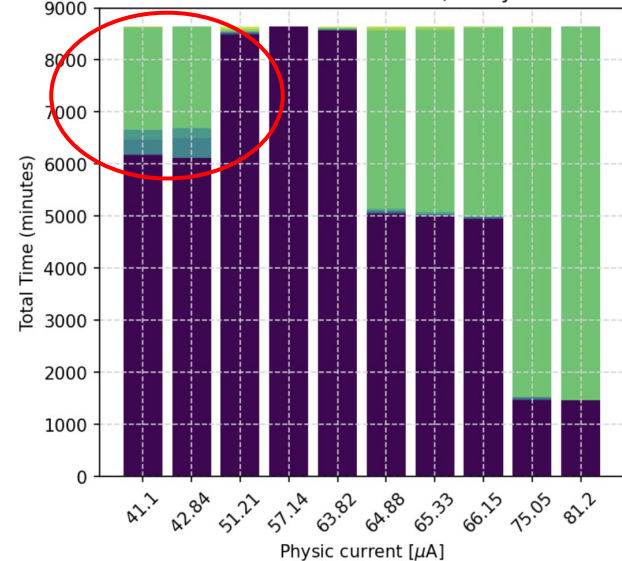
Irradiated time vs WP current, 4 day before



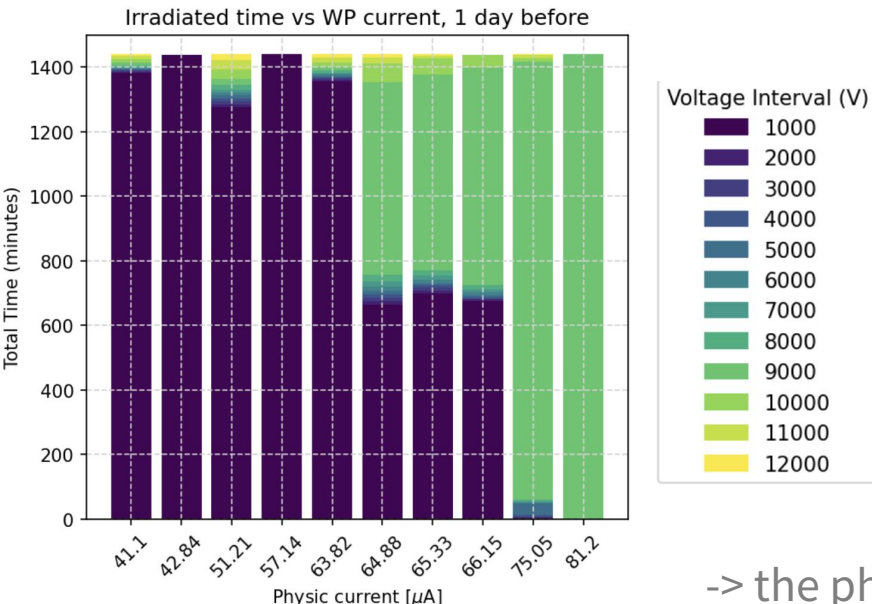
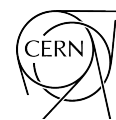
Irradiated time vs WP current, 5 day before



Irradiated time vs WP current, 6 day before

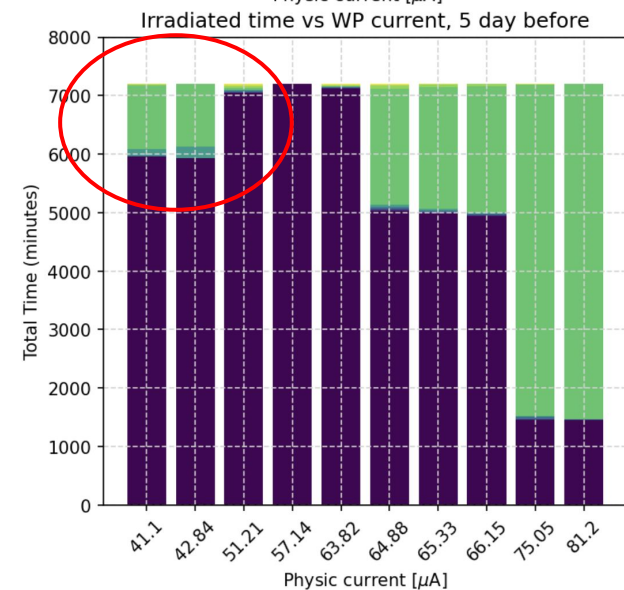


# Results for EP-DT

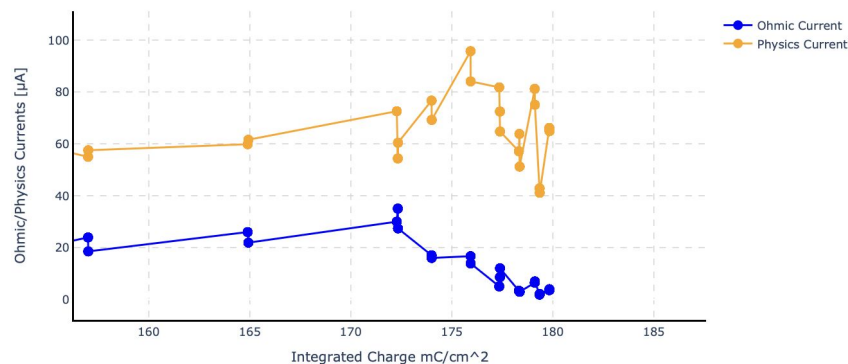


1. More the detector was kept on the day before, higher the current
2. This effect is stable if we consider the detector status up to 4 days before the scan
3. Before day 4, if the detector was kept on and then switched off for the day later, it manage to reduce the current before the scan.

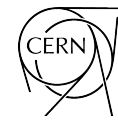
-> the physical current is strongly influenced by the detector status at least the 4 days before the scan.  
To be confirmed by the other detectors



EPDT-RPC25, ECO2, Source Off



# Open questions



In an LHC experiment, the maximum continued irradiation period is about 50 days  
 -> how much integrated charge is collected in this period?  
 -> do we have to emulate also the TS after that integrated charge?

This will bring a reduction of the currents after the days of stop.

