

# ProToV @GIF++

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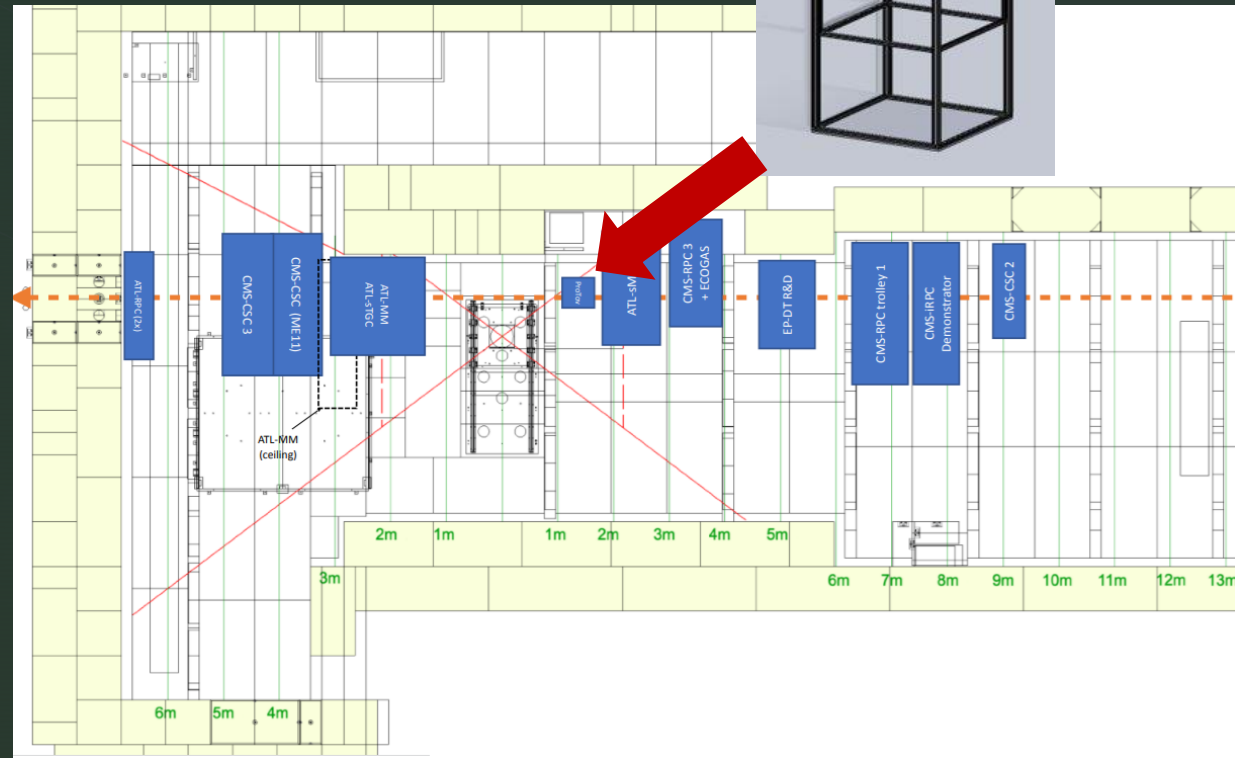


Università di Roma



# ProToV @GIF2021

70 x 70 x 180 cm Trolley  
2 gas pipes  
10 HV cables  
34 RG174 signal cables  
4 RPC Prototypes



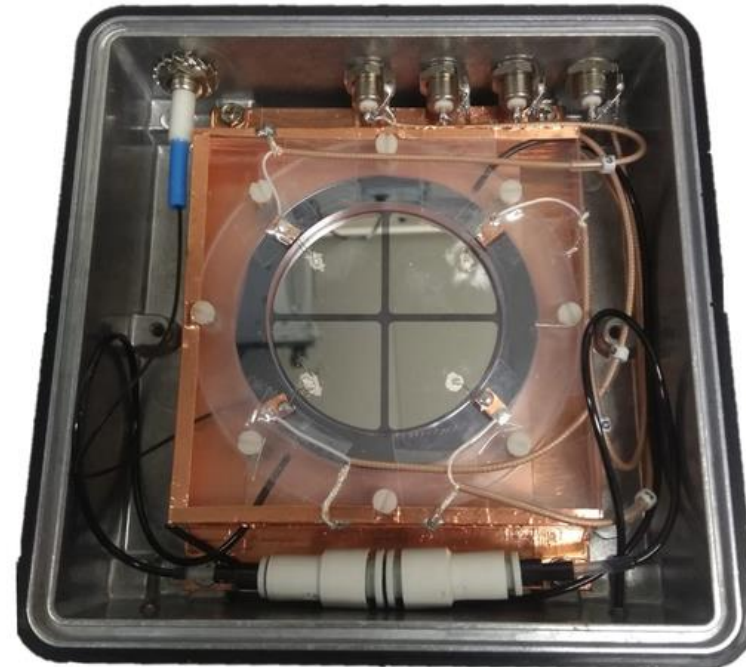
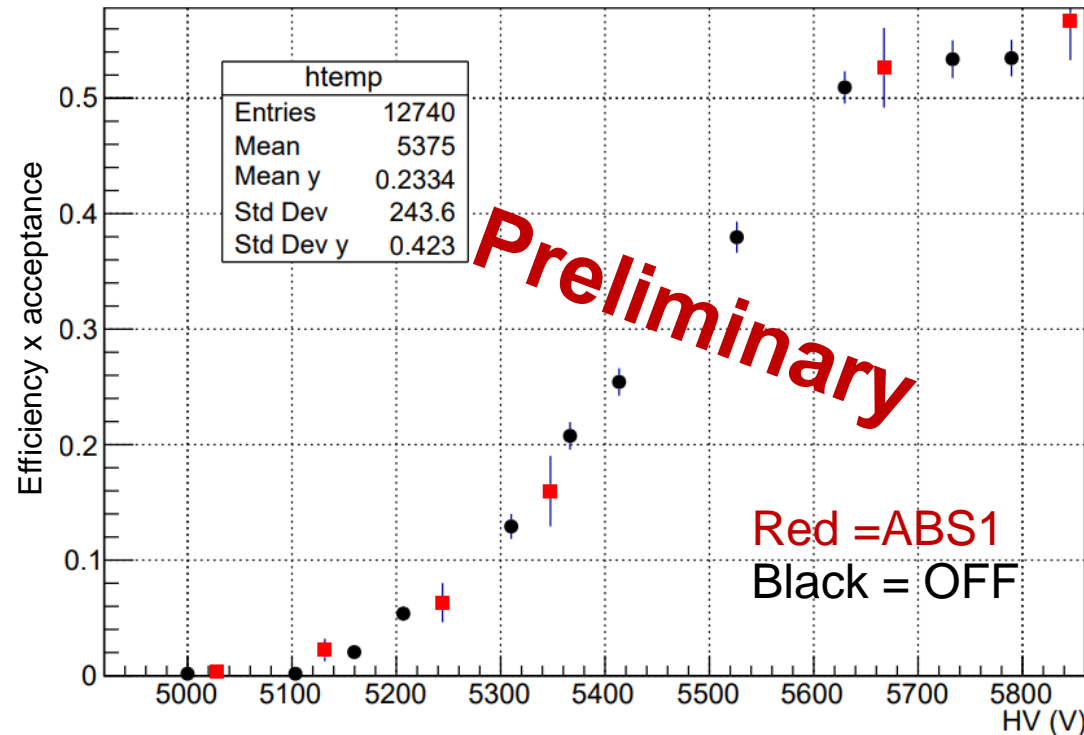
# Gallium Arsenide RPC

$\rho = 10^8 \Omega/\text{cm}$

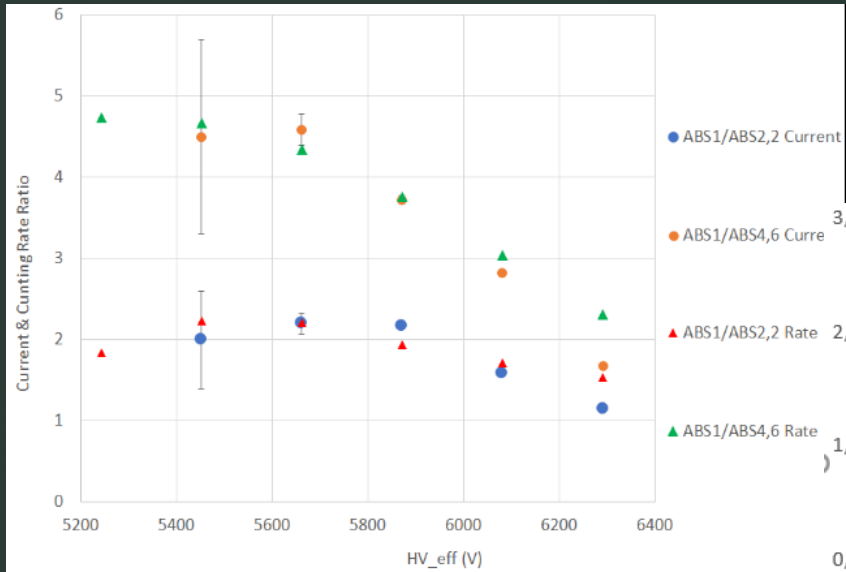
Counting Rate  $\sim 35 \text{ kHz}/\text{cm}^2$

Threshold  $\sim 5 \text{ fC}$

No dark counts !!!  $\longrightarrow$  will it still be true after aging?

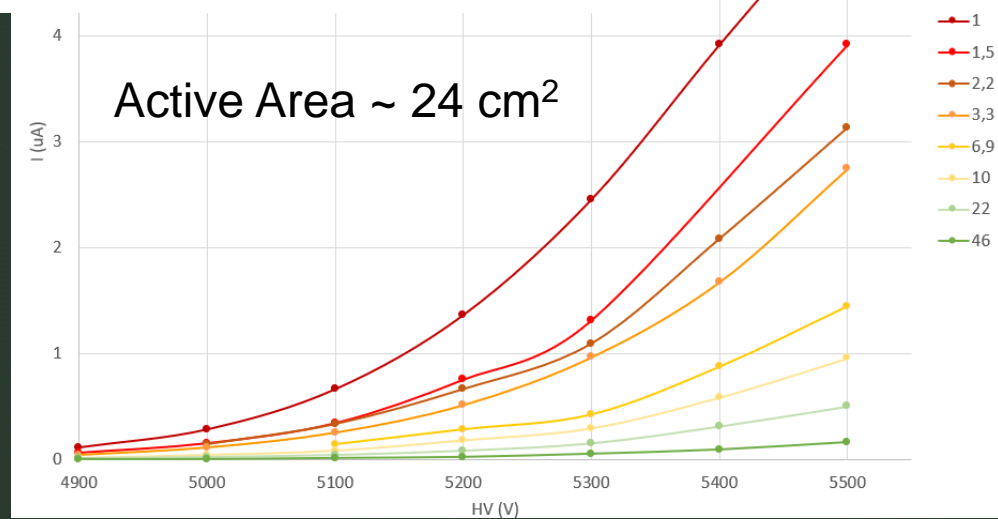
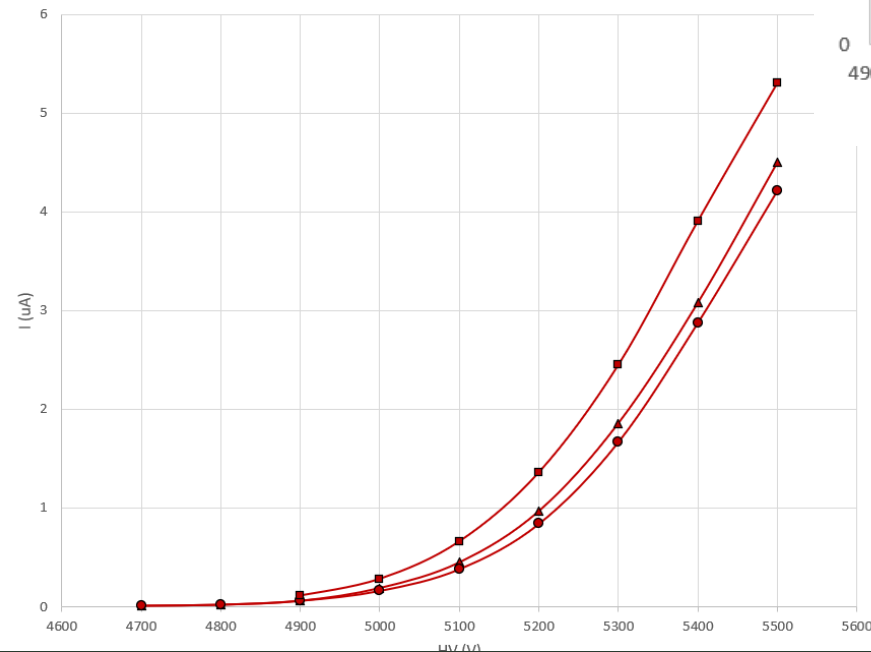
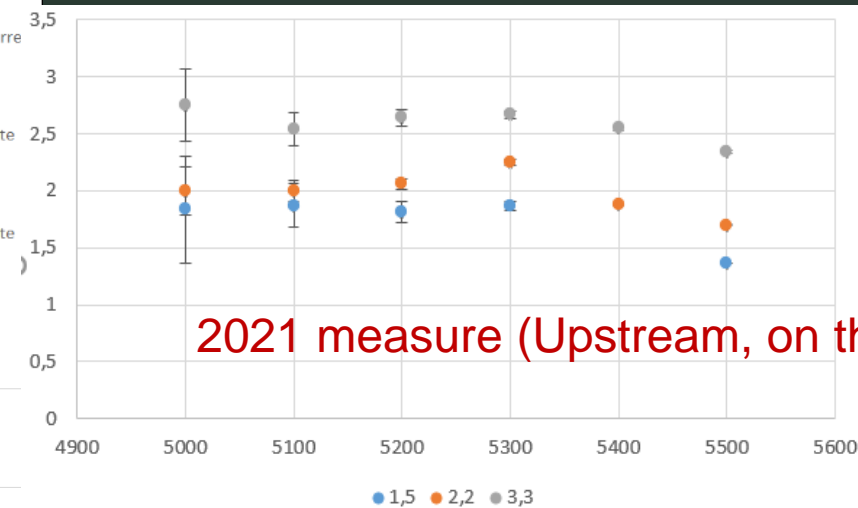


2019 measure (Downstream, almost at the center of the cone)



# Gallium Arsenide RPC currents

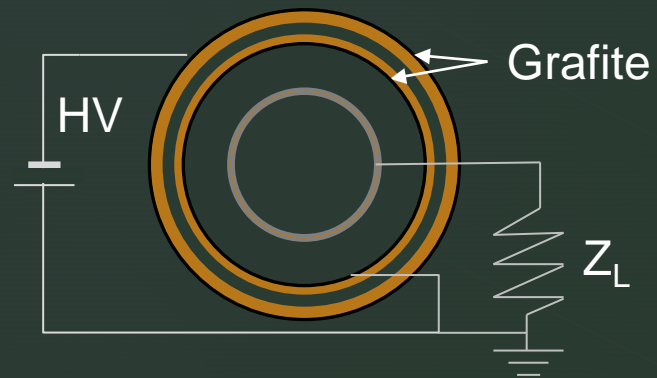
2021 measure (Upstream, on the edge of the cone)





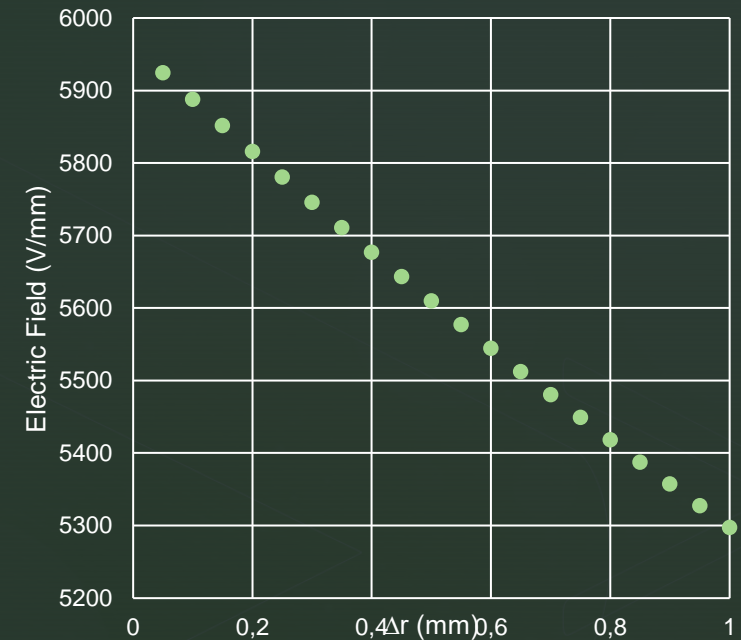
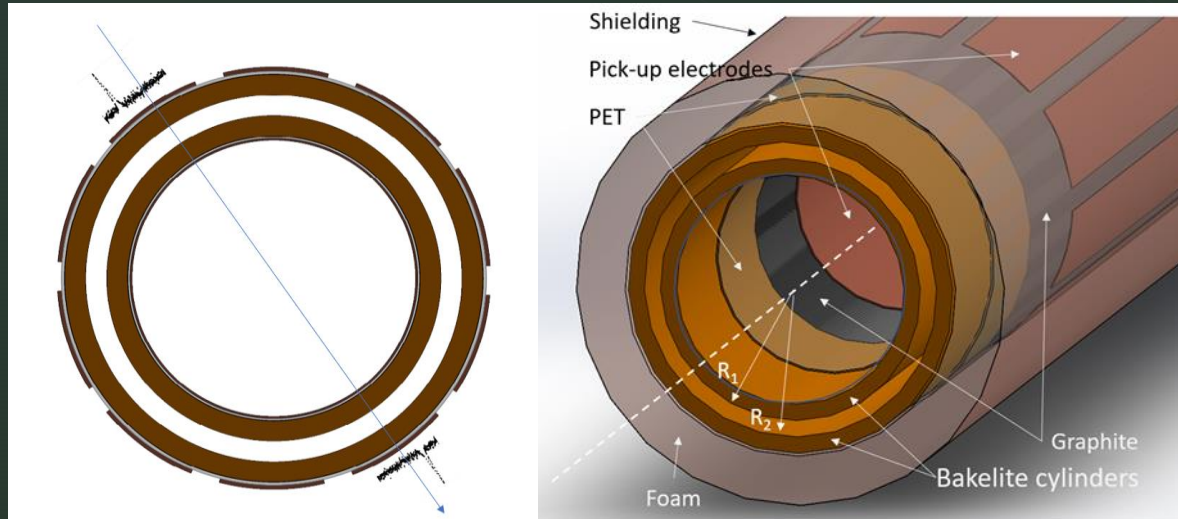
# Resistive Cylindrical Chamber RCC

Electric field inside the gas gap with  $\Delta V = +5600$  V



$D_1 = 16$  mm  
 $D_2 = 18$  mm  
 Gap = 1 mm

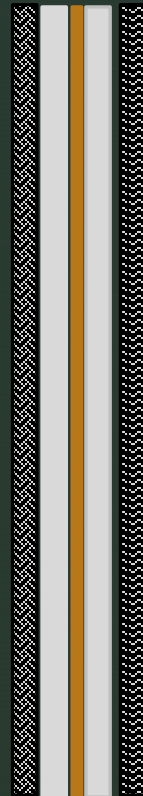
$$E(r) = -\frac{V}{r \log \frac{R_1}{R_2}}$$



# RPC with thin electrode and thin gap

1 RPC with 0.5 mm thick gas gap and 0.5 mm thick electrodes

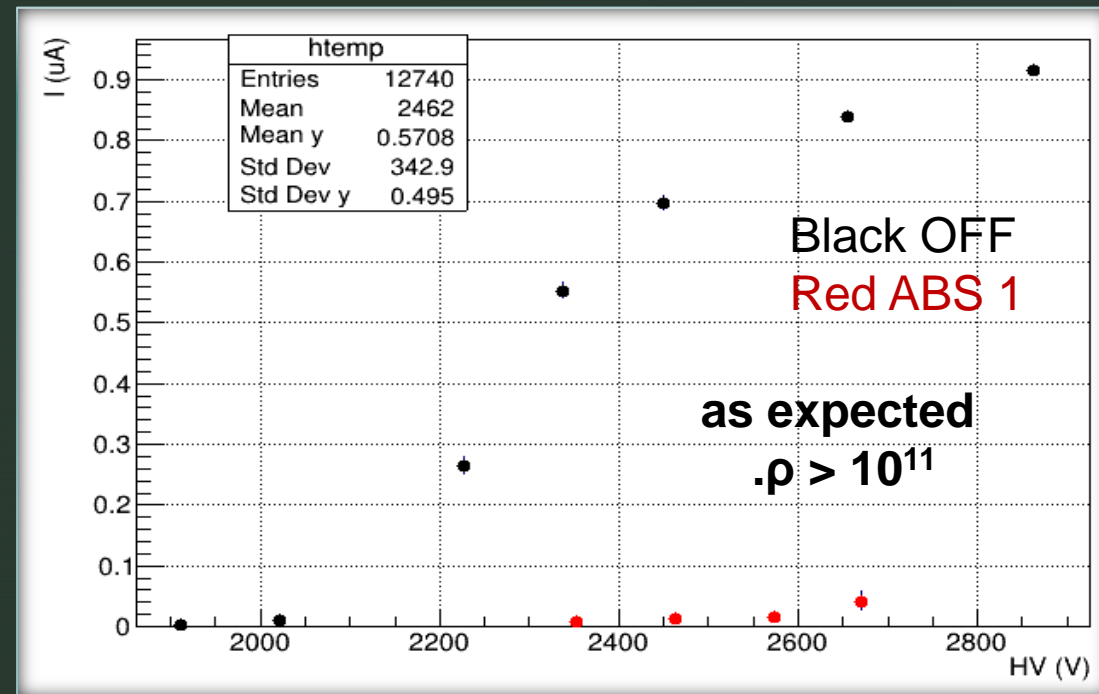
1 RPC chamber with two gas gap 0.2 mm thick and 0.5 mm thick electrodes



Read-out strip

Phenolic glass  
Gas gap

What's the limit?



# Plan for the future

Many tasks:

- RPC rate capability measurement with electrodes of various materials;
- analysis of the response of cylindrical geometry, study of the geometrical quenching (asymmetric rate capability?!)
- Study of the electrodes aging
- resistivity measurements of the material used for the construction of the prototypes

In general we would like to measure the rate capability of the detectors as a function of the constructive parameters, such as gap thickness, electrode thickness, electrode resistivity and geometric quenching factor. We would like to exploit the background radiation to carry out resistivity measurements of irradiated semiconductive material used for the construction of the prototypes.

## In what position?

# Conclusions

In the last months of 2021 we managed to install the infrastructure, many aspects remain to be defined:

- the position inside the bunker
- the gas patch panels.

We propose to establish some possible positions and move the setup in accordance with the needs of the test but above all with those of other users.