

# Beam test of LAPPD at CERN PS

INFN - Genova, INFN - Trieste, BNL

Deb Sankar Bhattacharya, Chandradoy Chatterjee, Silvia Dalla Torre, Mauro Gregori, Alexander Kiselev, Saverio Minutoli, Mikhail Osipenko

12:20

→ 12:30

**INFN test beam at CERN, overview**

Speaker: Deb Sankar Bhattacharya (INFN, Trieste, Italy)

12:30

→ 12:40

**INFN test beam at CERN, observed LAPPD Issues**

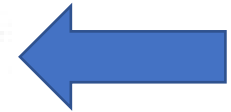
Speaker: Silvia Dalla Torre (INFN, Trieste)

12:40

→ 12:50

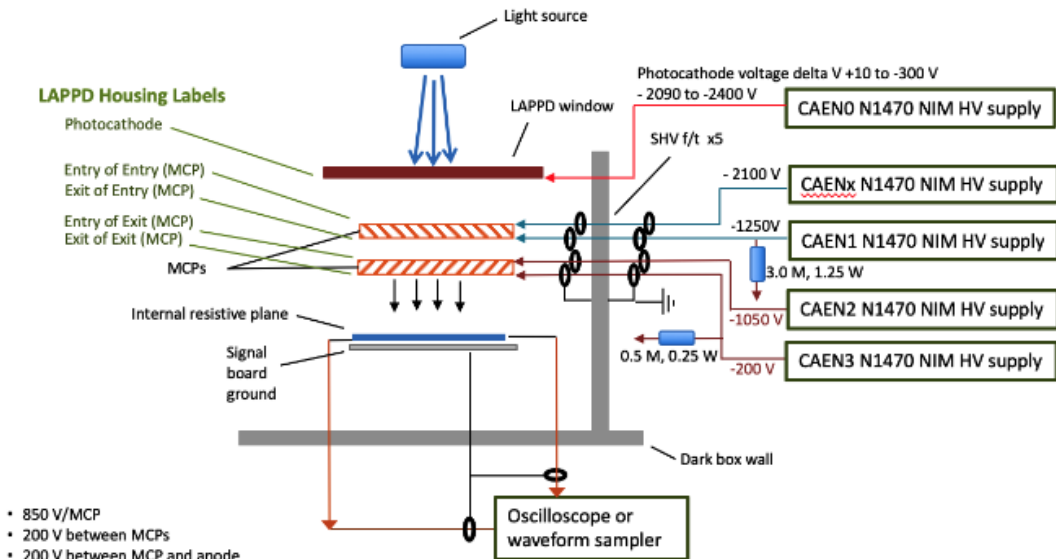
**INFN test beam at CERN, first hints about the data**

Speaker: Mikhail Osipenko



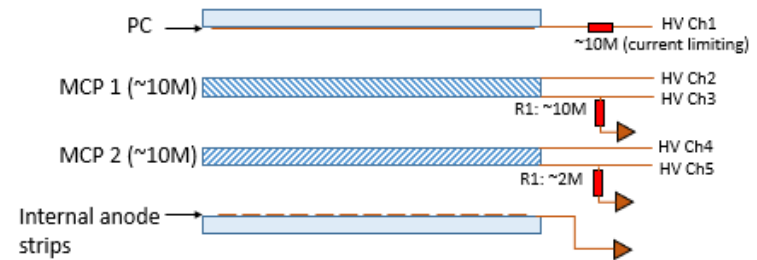
# HV supply

## Suggested by INCOM



- 850 V/MCP
- 200 V between MCPs
- 200 V between MCP and anode
- 6.2 M entry MCP R
- 5.7 M exit MCP R

## Used at BNL



CAEN R8034DN (19" rack-mount)  
-6kV, 1mA/ch, 5nA resolution

Courtesy by B. Azmoun

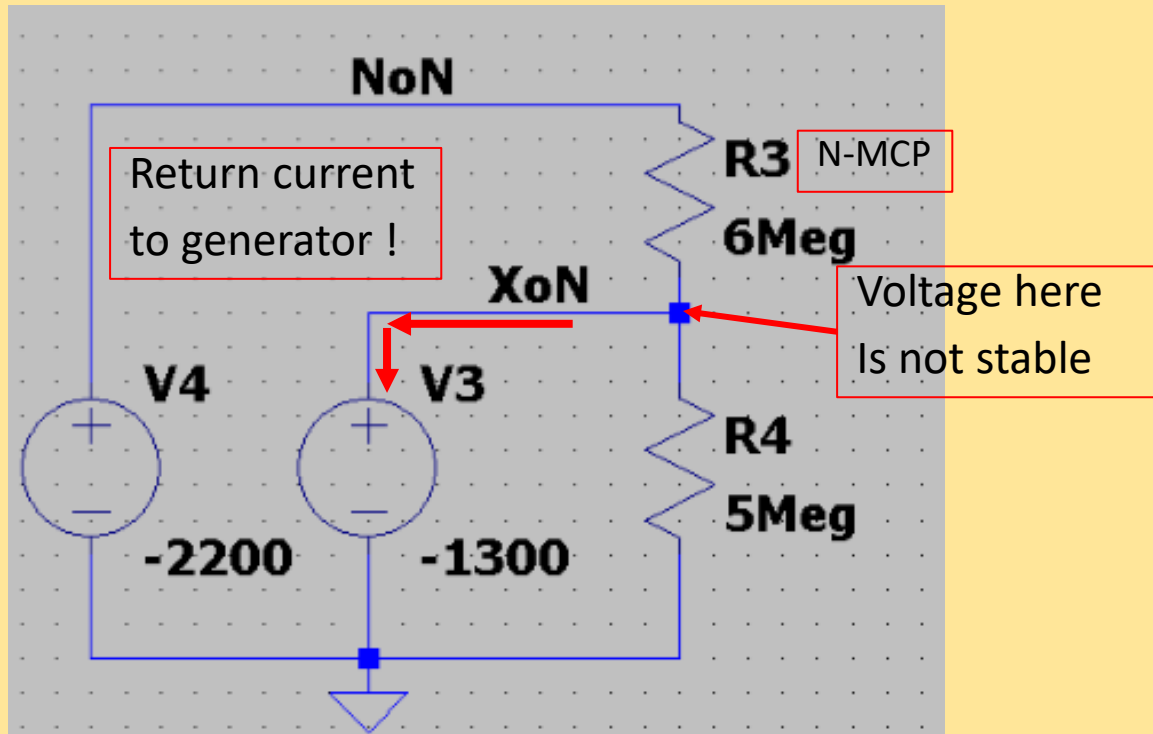
## Used at INFN-Bologna



Courtesy by V. Vagnoni

# HV supply

All these CAEN modules have “Common floating return”



Is the accident with tile no. 87 (short on X-MCP) related to the HV supply scheme used at the beginning?

*FYI: for the test beam tile no. 124 provided by INCOM in emergency*

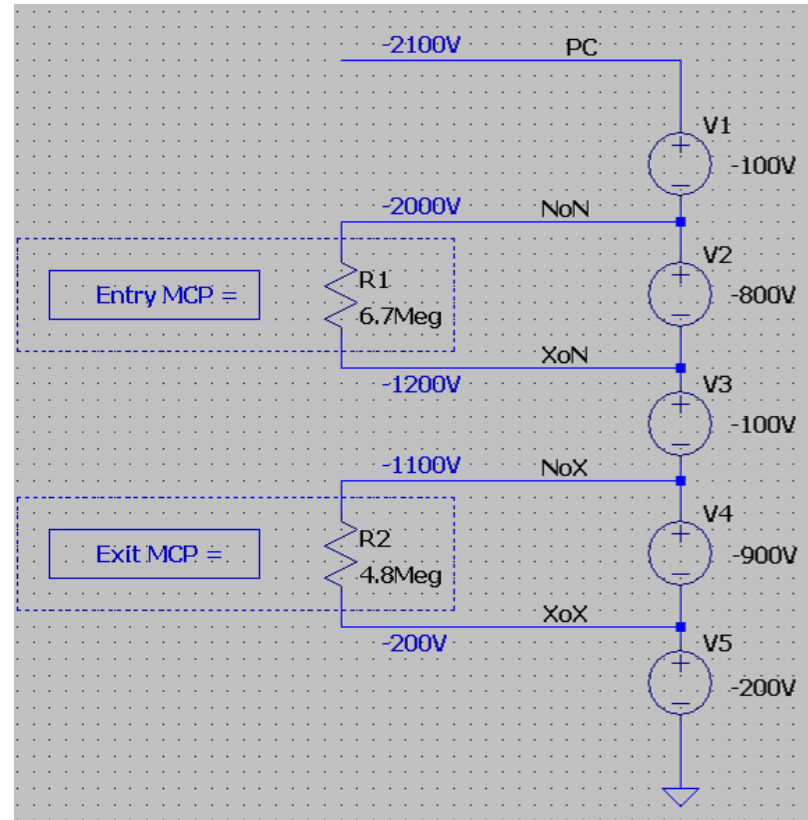
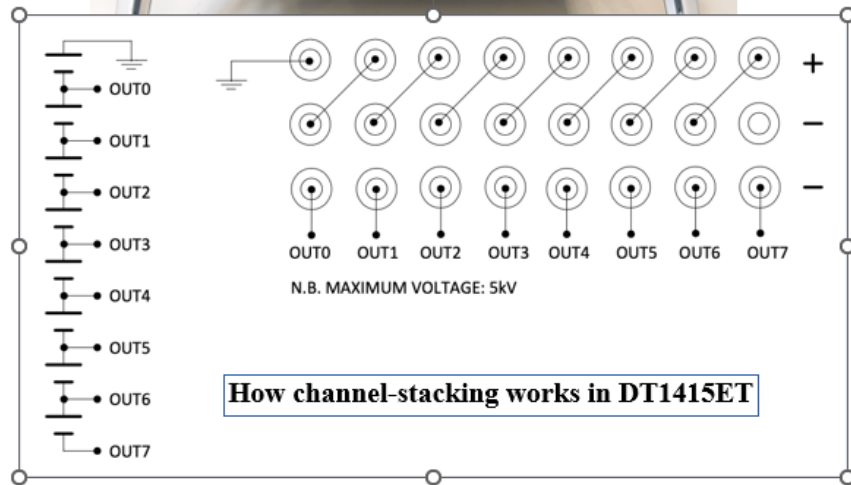
- electrical instabilities observed at our test beam
  - incorrect current read-out with related overvoltage
- use a conceptually different PS

# HV supply

## The HV setup



CAEN DT1415ET Floating HV supply



electrical stability obtained

# PHOTOCATHODE QUALIYTY

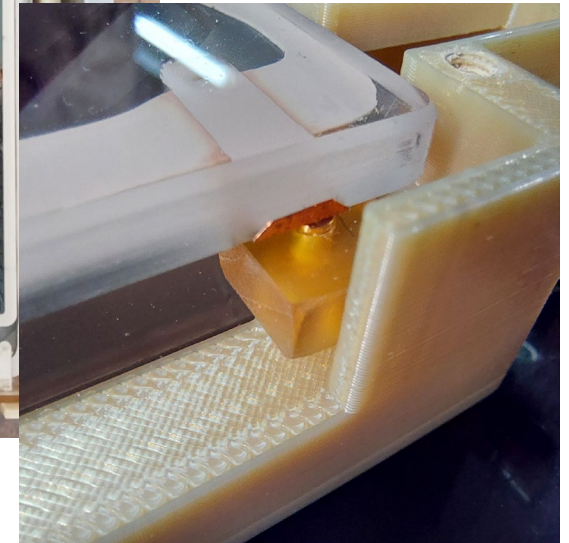
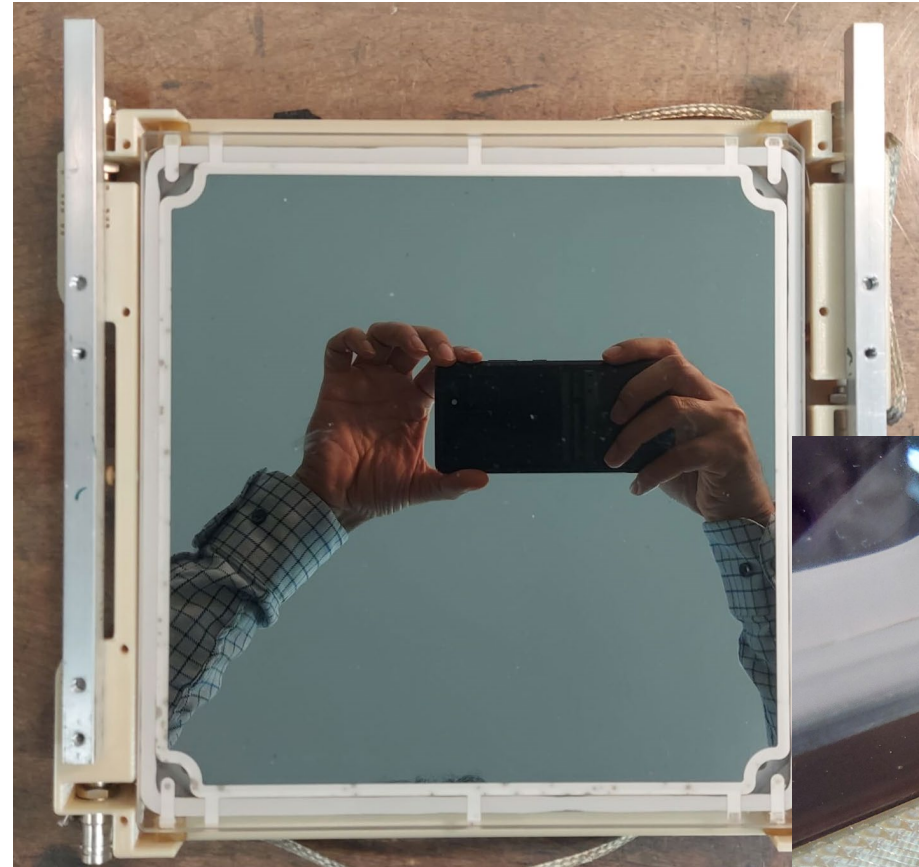
Difficulties experienced with tile no. 124 (the replacement)

- Photocathode with high thermal noise emission
- Requiring conditioning before operation
- Nevertheless, only non optimal PC voltage could be applied
- Interplay between PC voltage and N-MCP voltage onserved
- Ideal supply could not be applied, in particular low PC voltage → this compromises the TTS
- Information about the yield of “good” vs “bad” photocathodes needed

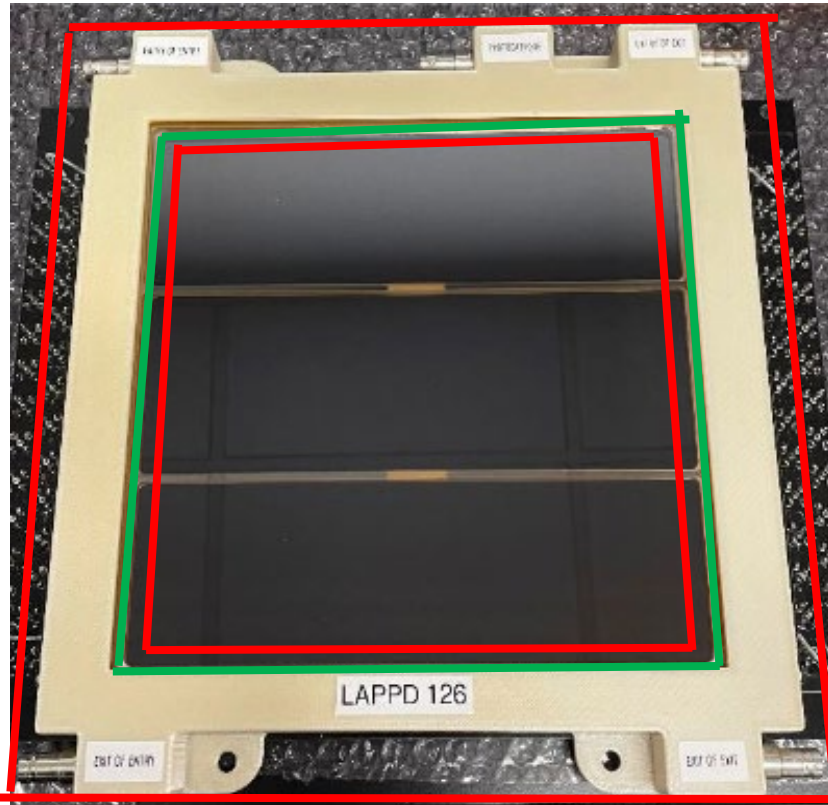
# Electrical connections

HV distributed to the various electrodes via Pogo Pin Connectors touching a small strip

- small contact surface
- oxidation of the contact point
- Critical alignment
- The elasticity of the plastic tile support can produce misalignments (observed)
- Contact point different for different tiles,  
In particular Grounding  
(in our case tiles no. 87 and 124)



# Active surface



## Needs for EIC and , in general, for particle/nuclear physics experiments:

- Re-engineering the electrical and mechanical aspects
- All services within the green contour, in vertical arrangement
  - At present, active area < 50%
- Reliable electrical connections
- STANDARDIZATION: tile of a same family should have the same electrical layout