Report of the HBHE irradiation test at CERN

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- Transporting cable-holder chain and the rack
- PRBS results
- PRBS Error Rate per high energy eq. fluency and per hour

The CHARM facility

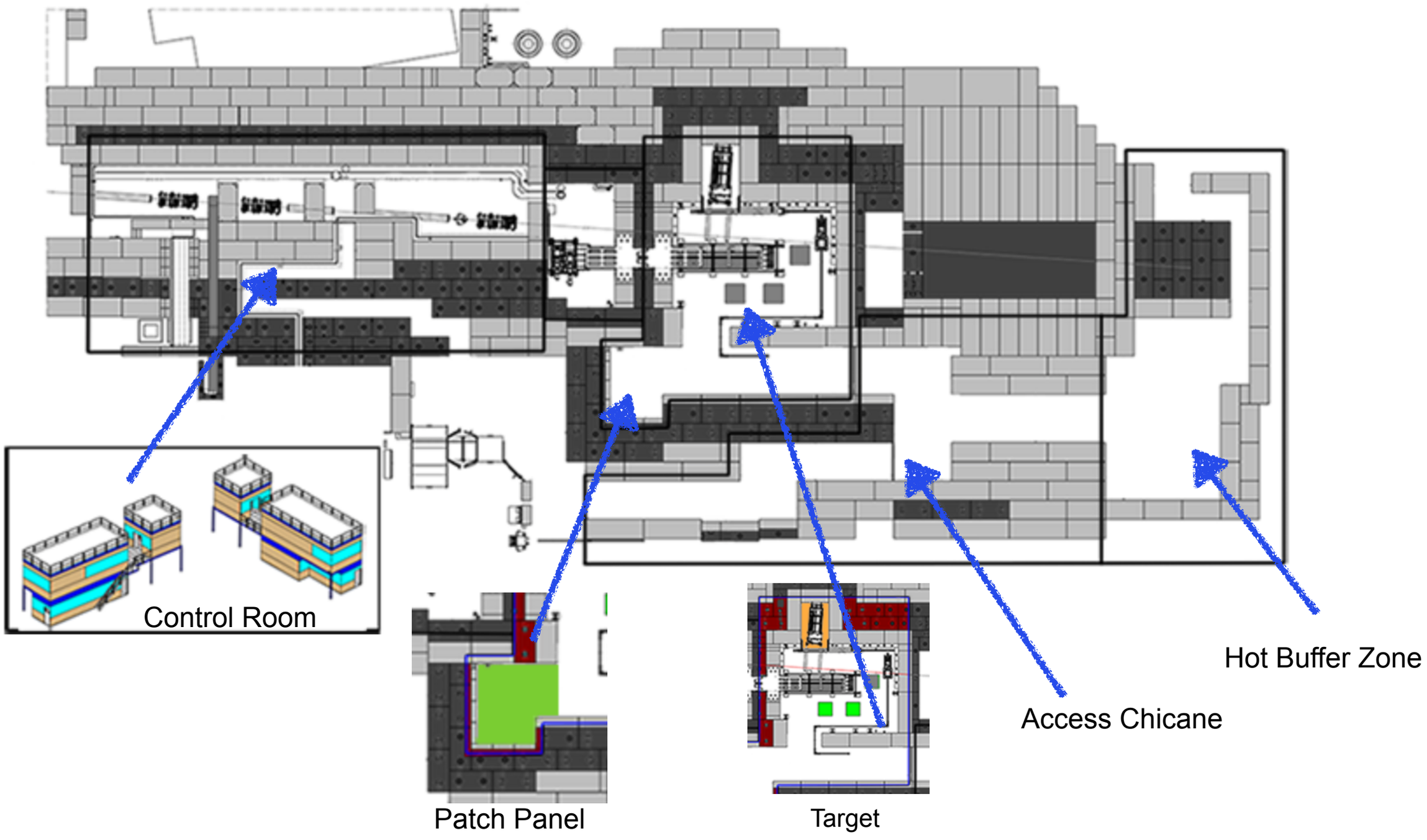
- CERN East Hall in bldg. 157, on the beam line T8
- 3 different target types are used:

  Copper,Aluminium sieve and Aluminium

- 24 GeV proton beam

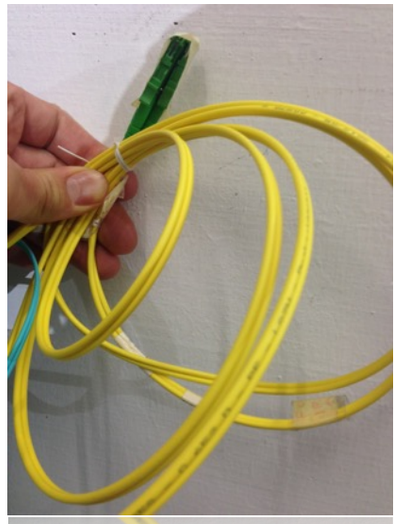
The CHARM Facility

Map

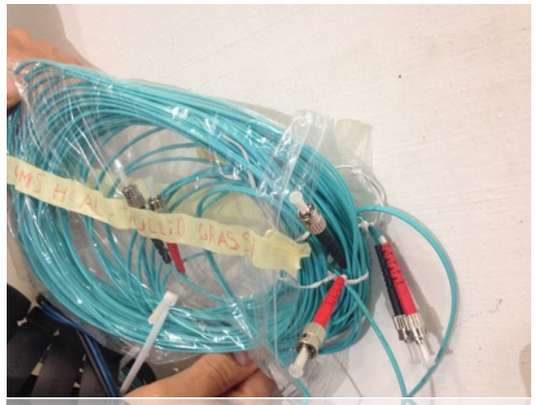


Cabling in the radiation area
CHARM Facility

power cable



Single Mode duplex finer

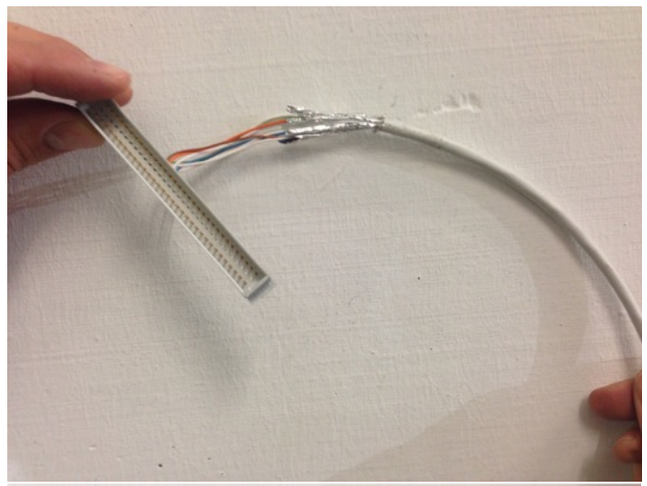


6 Multi Mode fiber

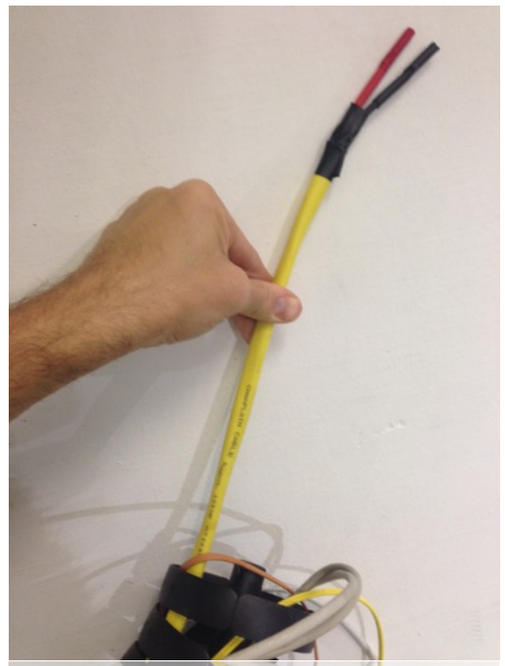
ethernet cable

- Cables for patch-panel and for the backplane of front end

fibers

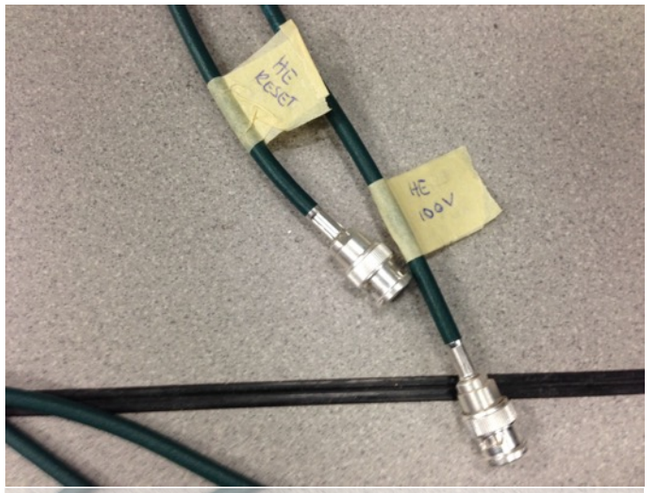


end of the network cable

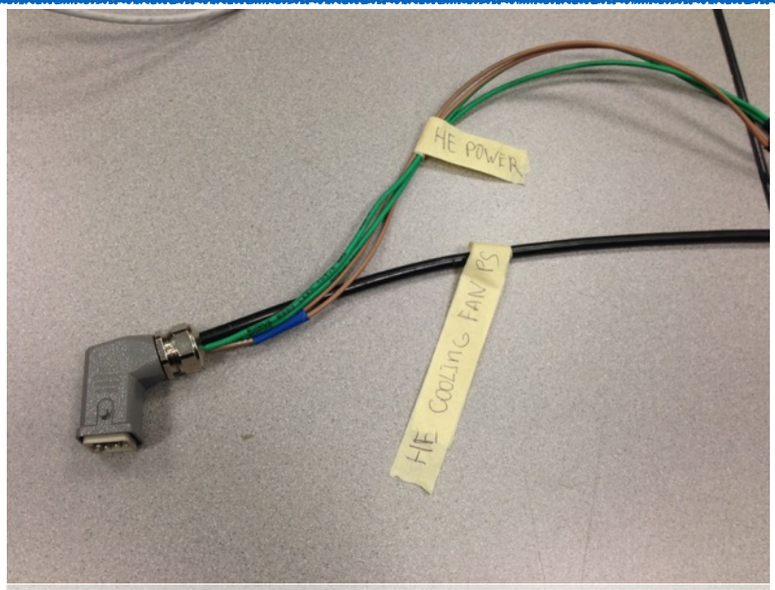


end of the power cable

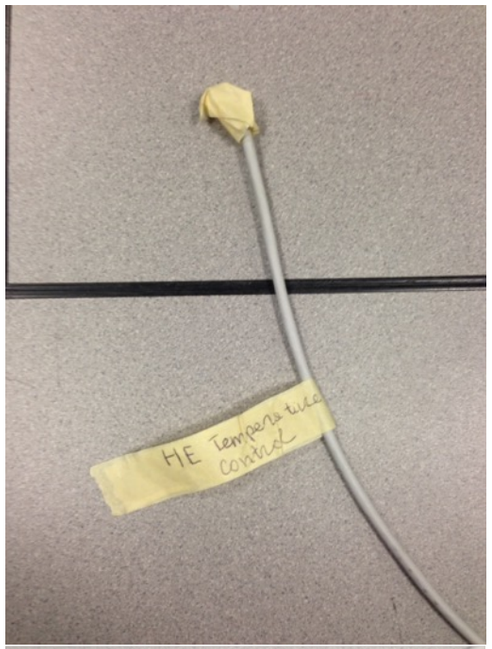
Cabling in the preparation room CHARM Facility



2 HE BNC Cables



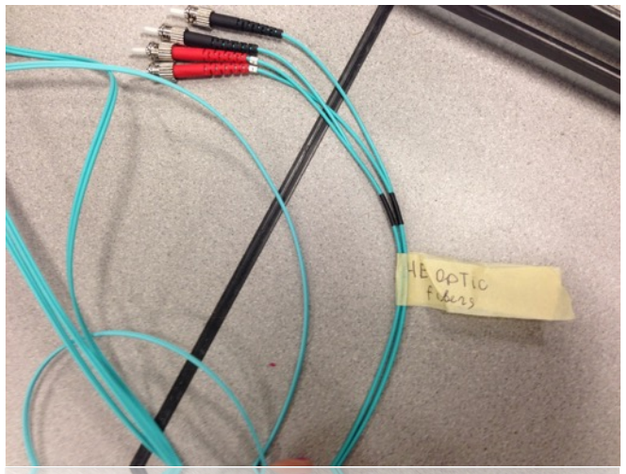
HE power cable

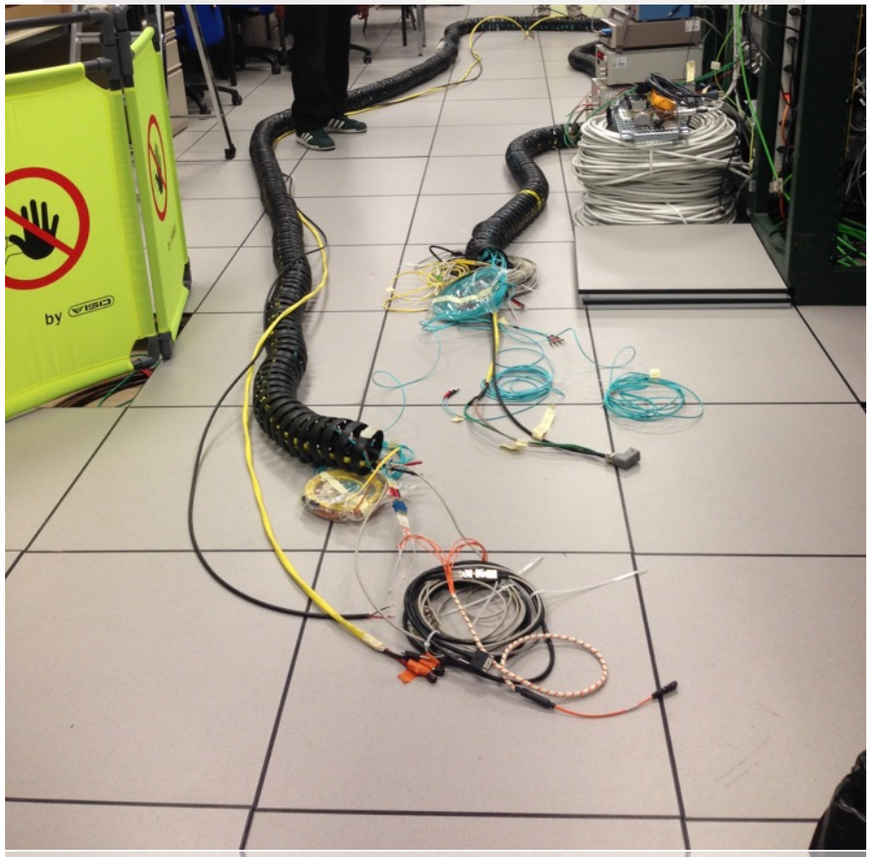


HE ethernet cable

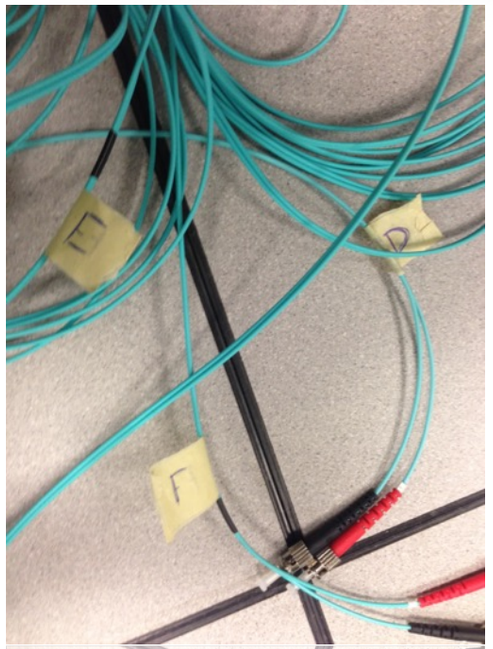
6 HF MM Cables

4 HE MM fibers

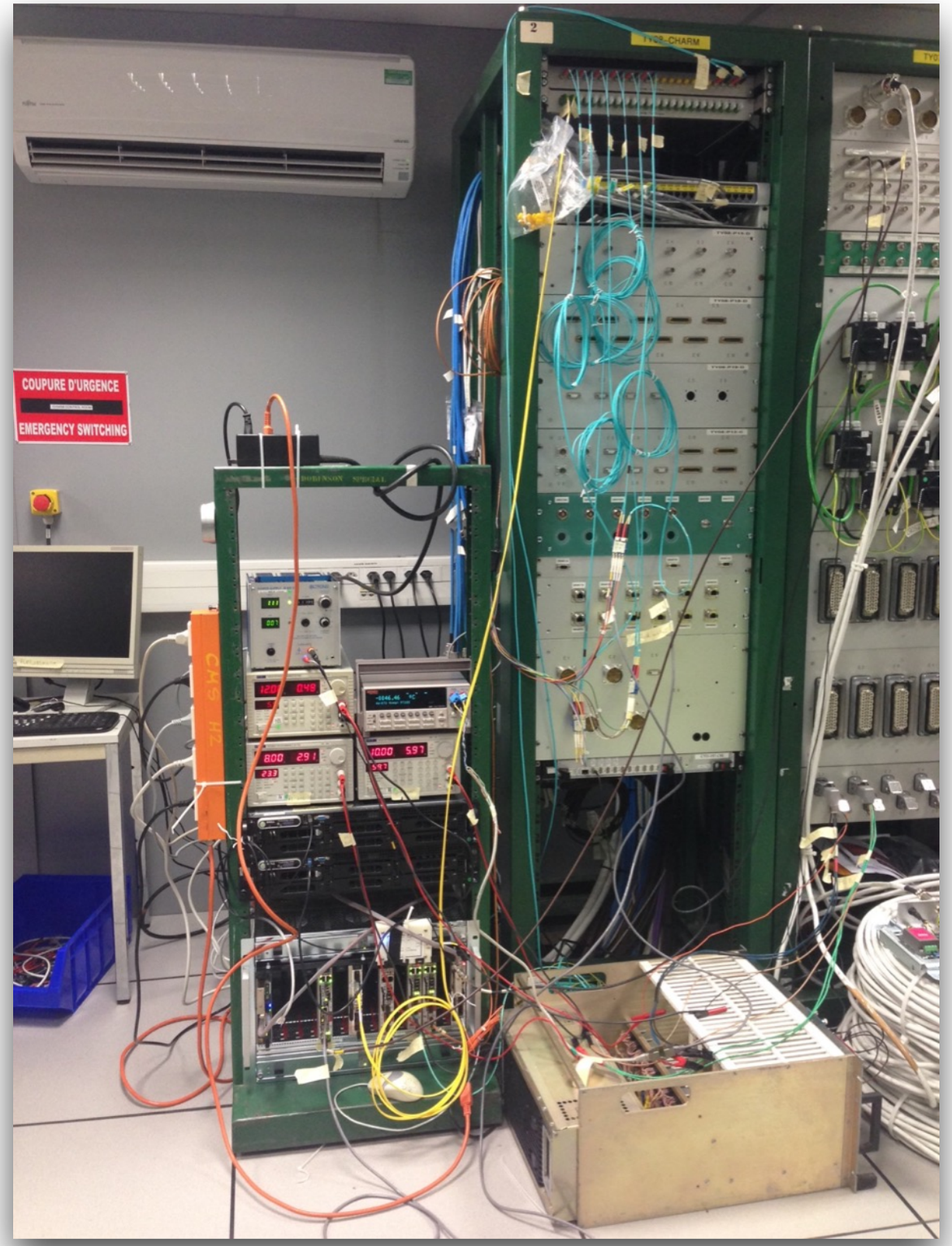




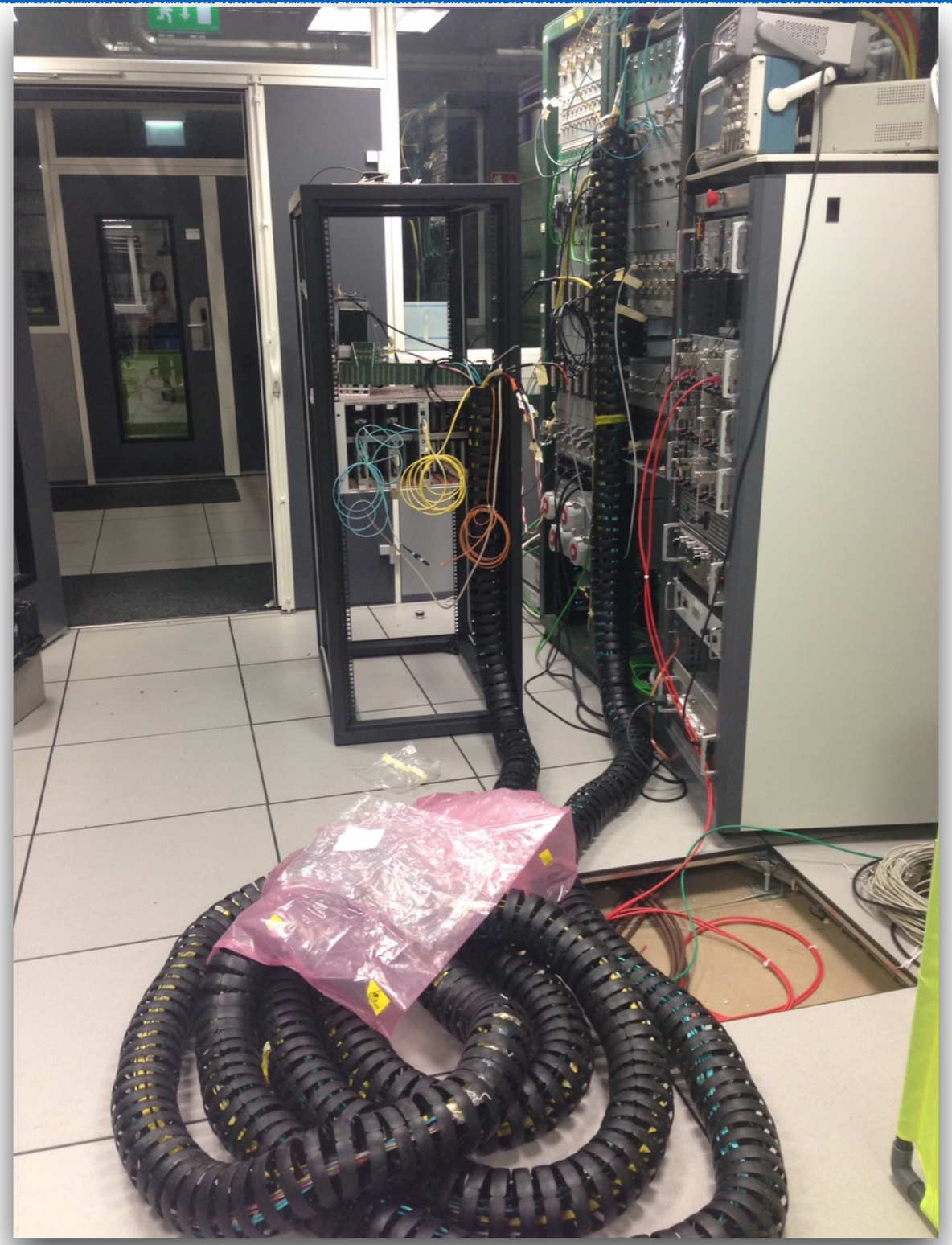
cable-holder cain



Testing the cabling with cable-holder chain



FE Controler(BE Crate)

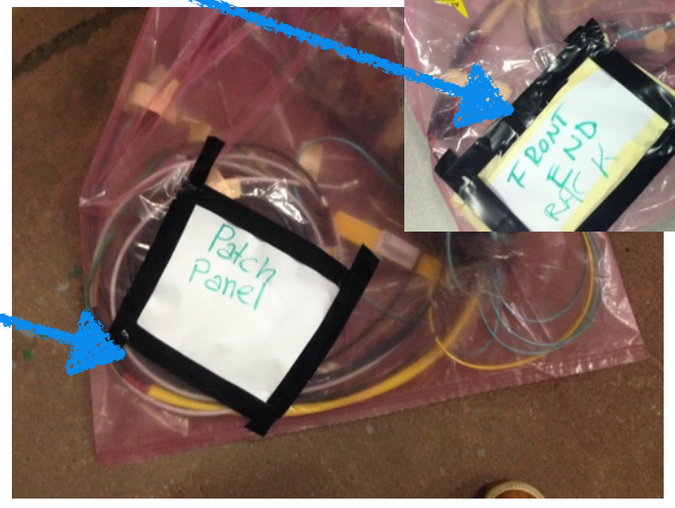


Patch panel and FE Crate

Cable-holder chain in the buffer zone outside the controlled area

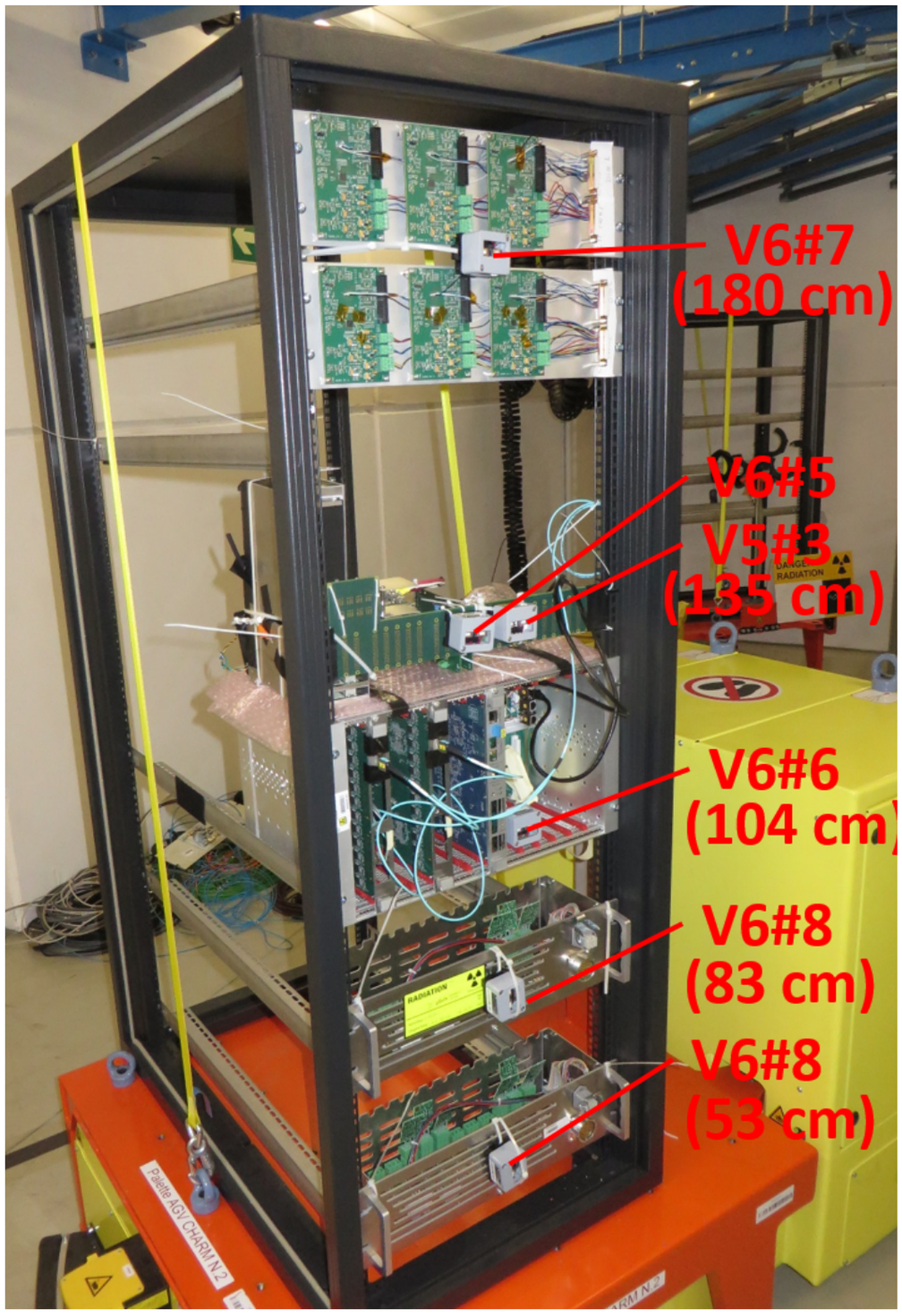
- Cable-holder chain

with some protection and labels on both ends (which is the **FE end** and which is the **panel end**).



Moving the cable-holder chain from buffer zone to the radiation area

Our Setup in the irradiation area CHARM



- pictures of our setup just before it was moved to the connection point with radiation measurement electronics (RadMon)

Rack Transportation

The results of a bit error rate detection in the ngFEC - ngCCM communication using 23 Bits PRBS in the irradiation test

- We have not observed any PRBS errors during the dry run using both Finisar FTLX1370W3BTL and Finisar FTLX1471D3BCL SFP+ modules.
  - We used the FTLX1370W3BTL during the irradiation test
- PRBS errors in the ngCCM -> ngFEC path were proportional to the radiation dose (Copper > Aluminium > Aluminium sieve) as expected
  - Error did not increase constantly, but rather small bursts in short time intervals.
  - With the copper target, the error rate increased as much as ~1000 error patterns per two minutes (script's time resolution).
- We observed errors on the ngFEC -> ngCCM path only in four instances: Three of them are due to restart of the ngFEC FC7.

PRBS Error Rate per high energy hadron eq. fluence and per hour