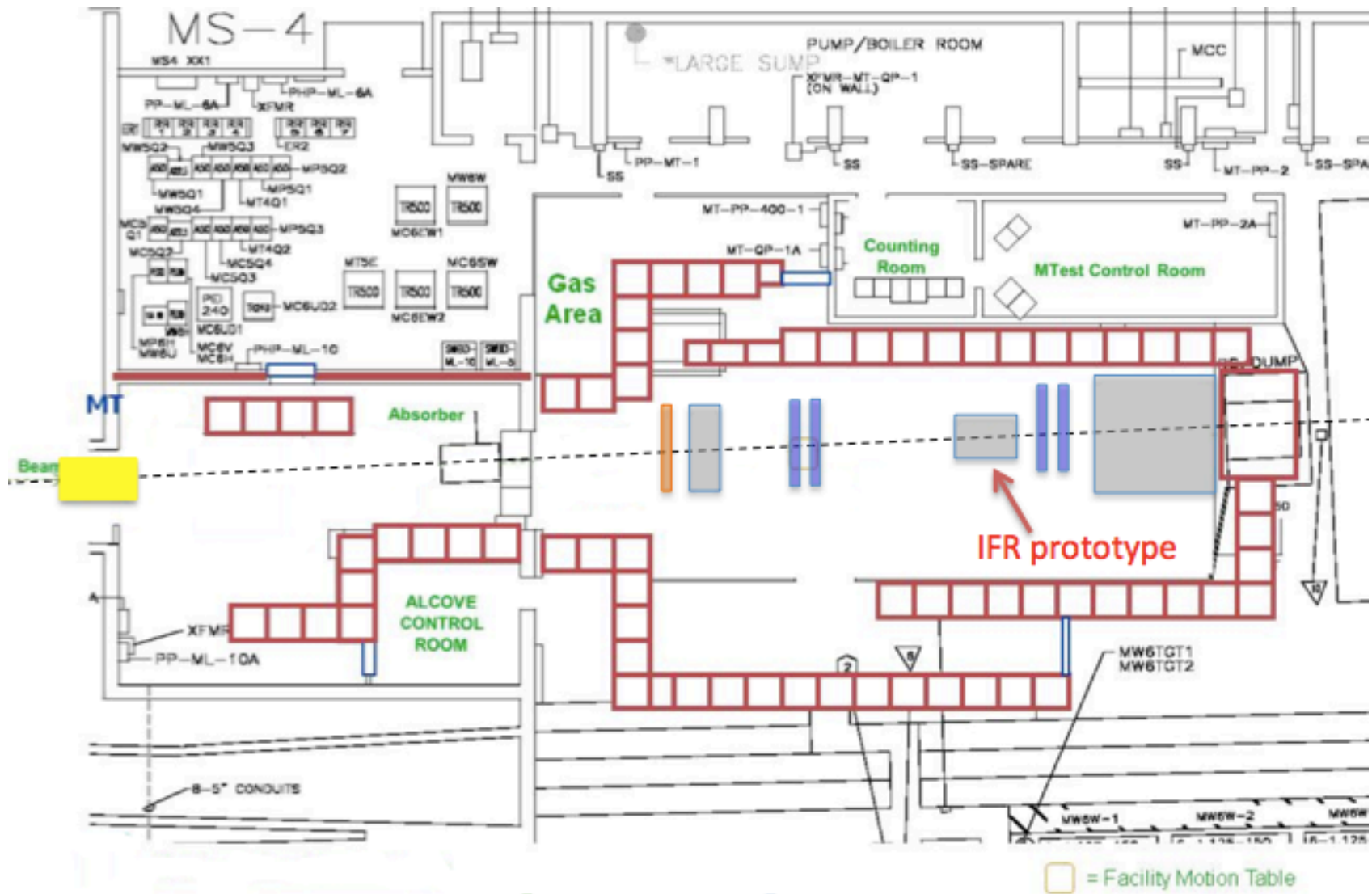


IFR Background and Full Simulation – Status and plans

G. C., N. Gagliardi, M. Rotondo

USING BRUNO FOR BEAM TEST SIMULATION

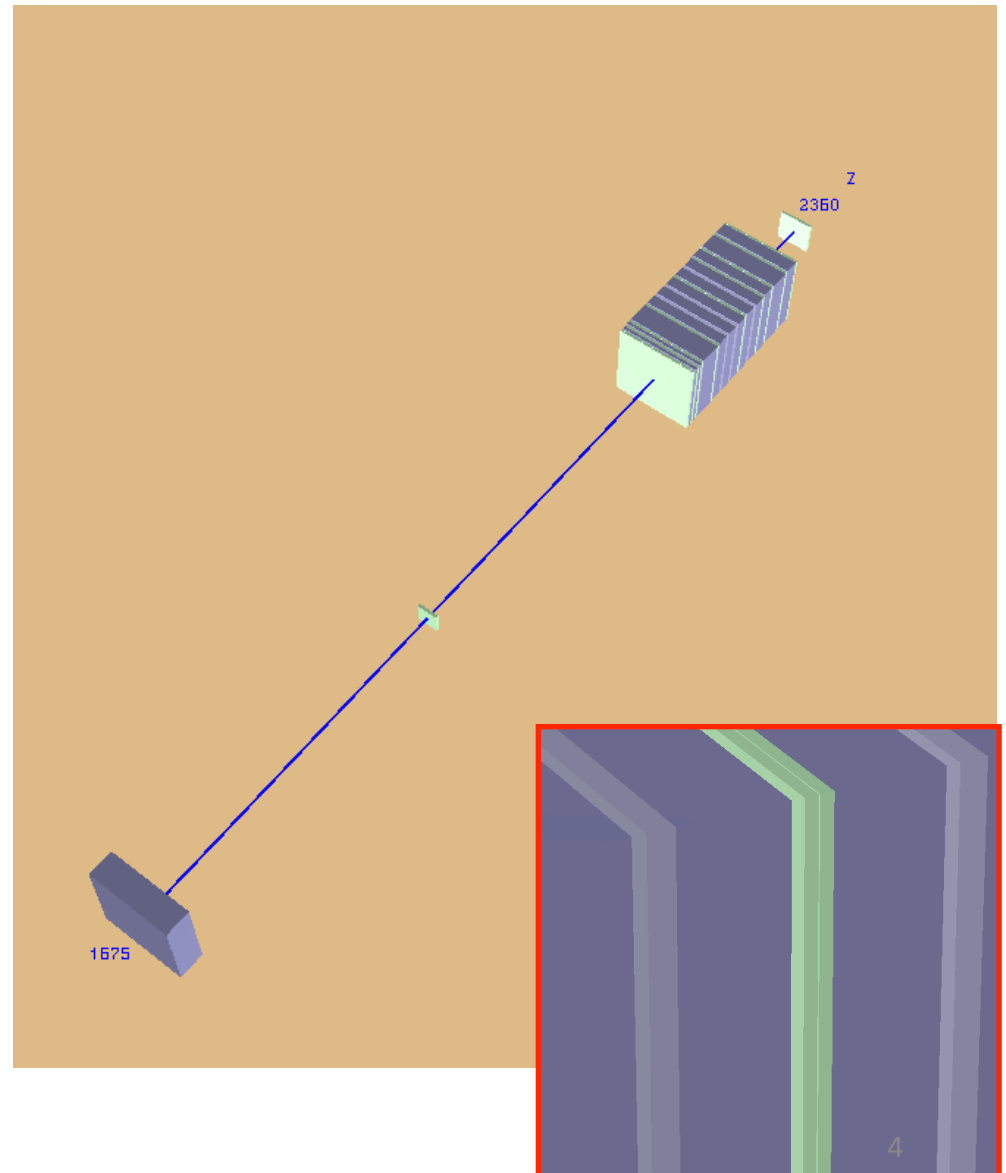
Beam test Setup



- Cerenkov
- MWPC
- TOF
- PMTs
- = Facility Motion Table

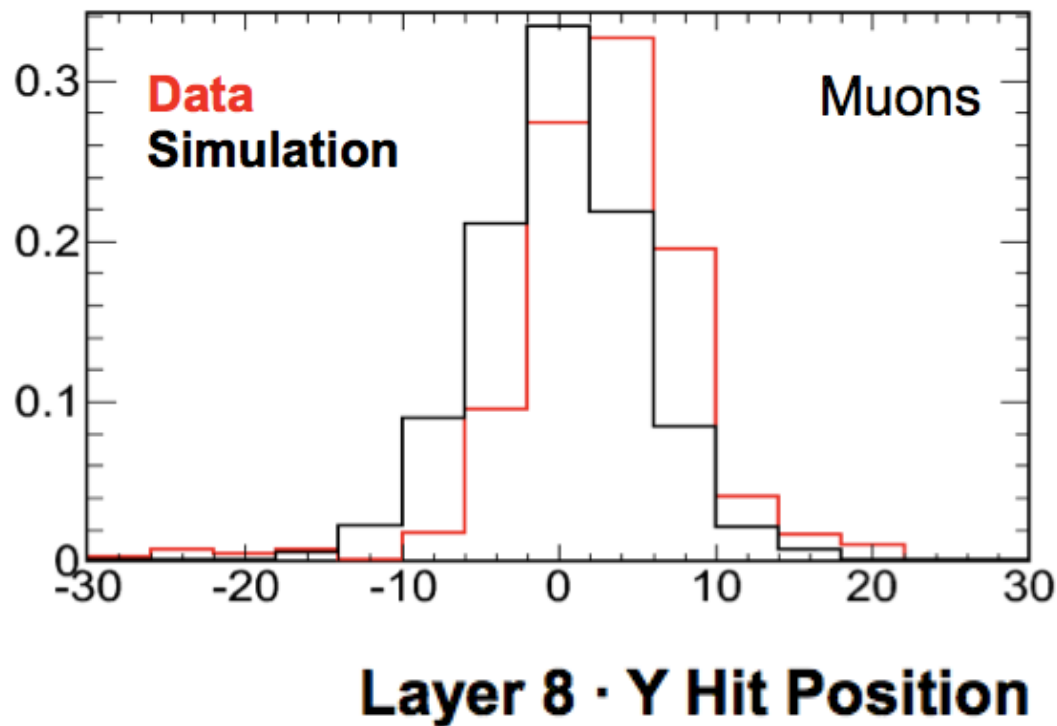
Beam test Monte Carlo simulation

- Full Sim is used to simulate the Beam test setup
 - Iron plate in front of the stack
 - trigger scintillators before and after the prototype
 - IFR prototype
- Two ways interaction Data-MC
 - MC is used to understand detector acceptance and to study some particle contamination;
 - Data are use to tune the MC hadronic shower description
- Generated samples of mu, pi, e^\pm
- Beam composition studies in progress
- Then we need to modify/upgrade/ implement reconstruction code that is quite different wrt the one developed so far in the Full Sim.



Comparison between beam test data – MC Muons

6 GeV/c Run

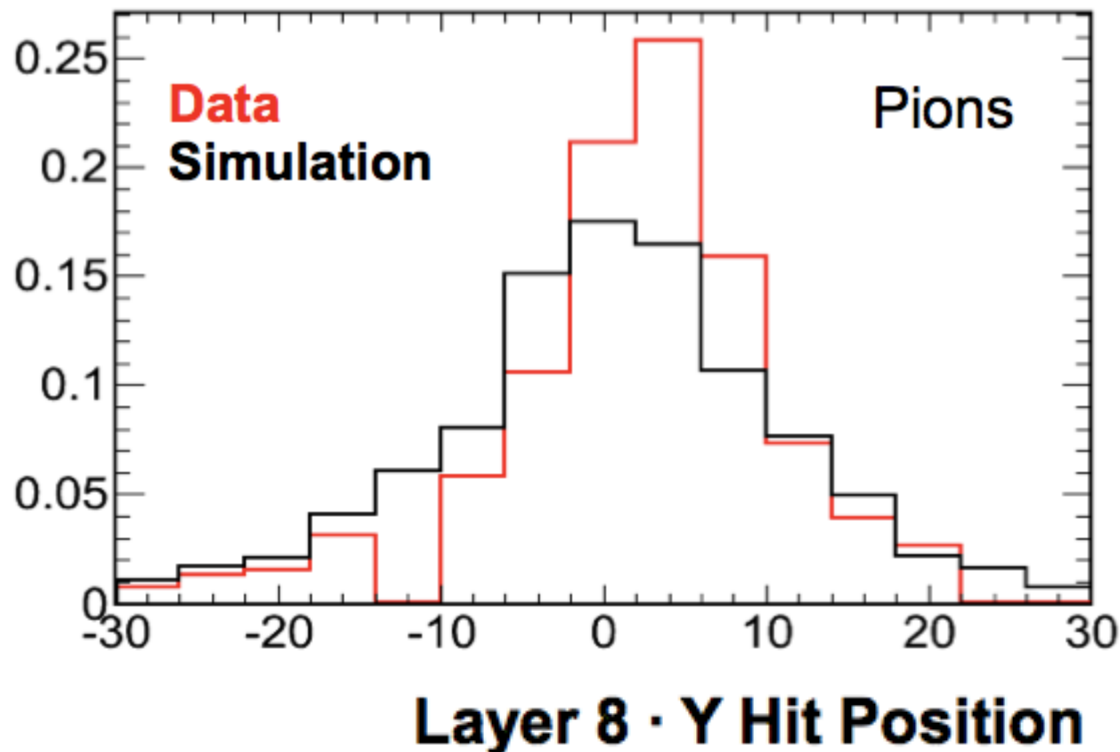


- Data distribution is slightly larger
- 6 cm shift from of the mean value due to a tilt of the prototype iron structure wrt the beam axis.
- Overall good agreement between data and MC

Comparison between beam test data – MC

Pions

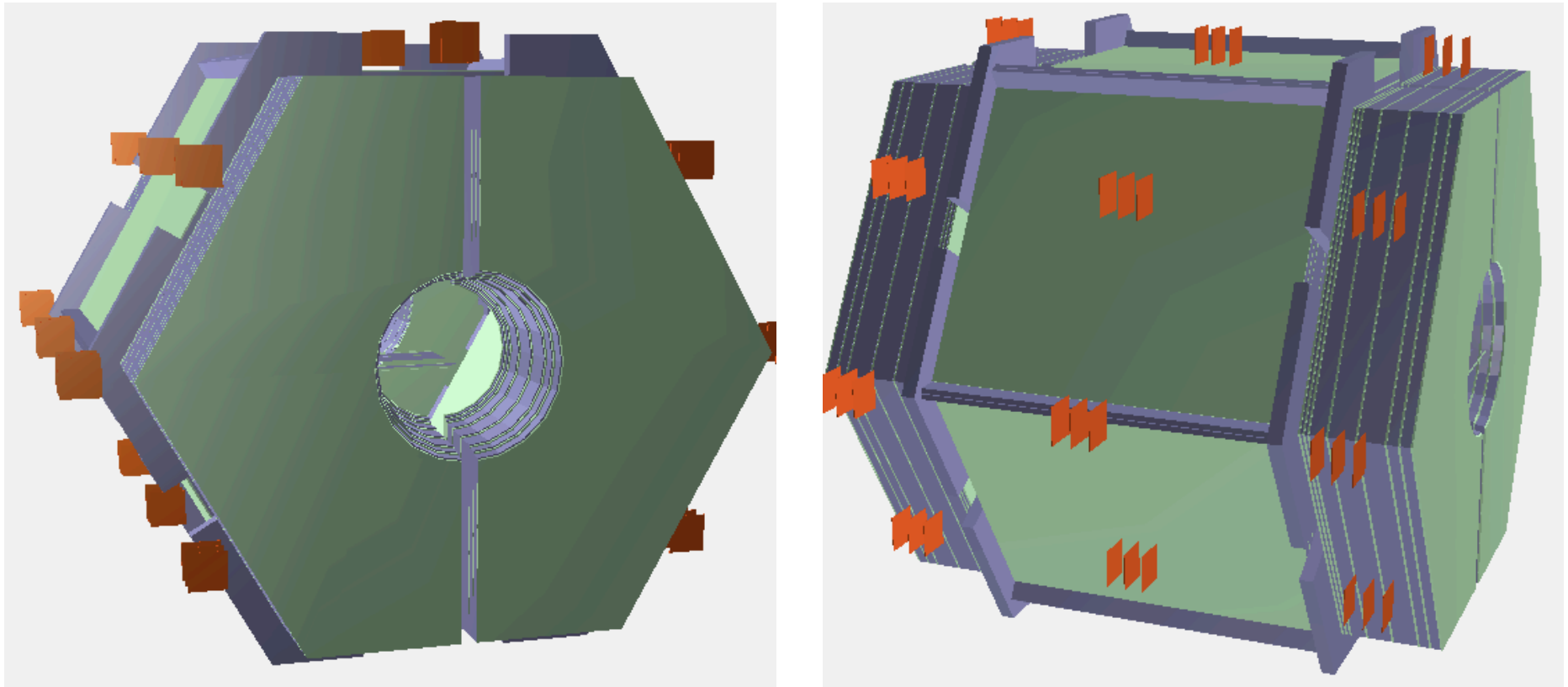
6 GeV/c Run



- Sizable difference between data and MC.
- Data are narrower indicating a contamination of muons in our pion sample.
- PID device located about 20 meters upstream wrt our prototype: mismatch probably due to pions decay.

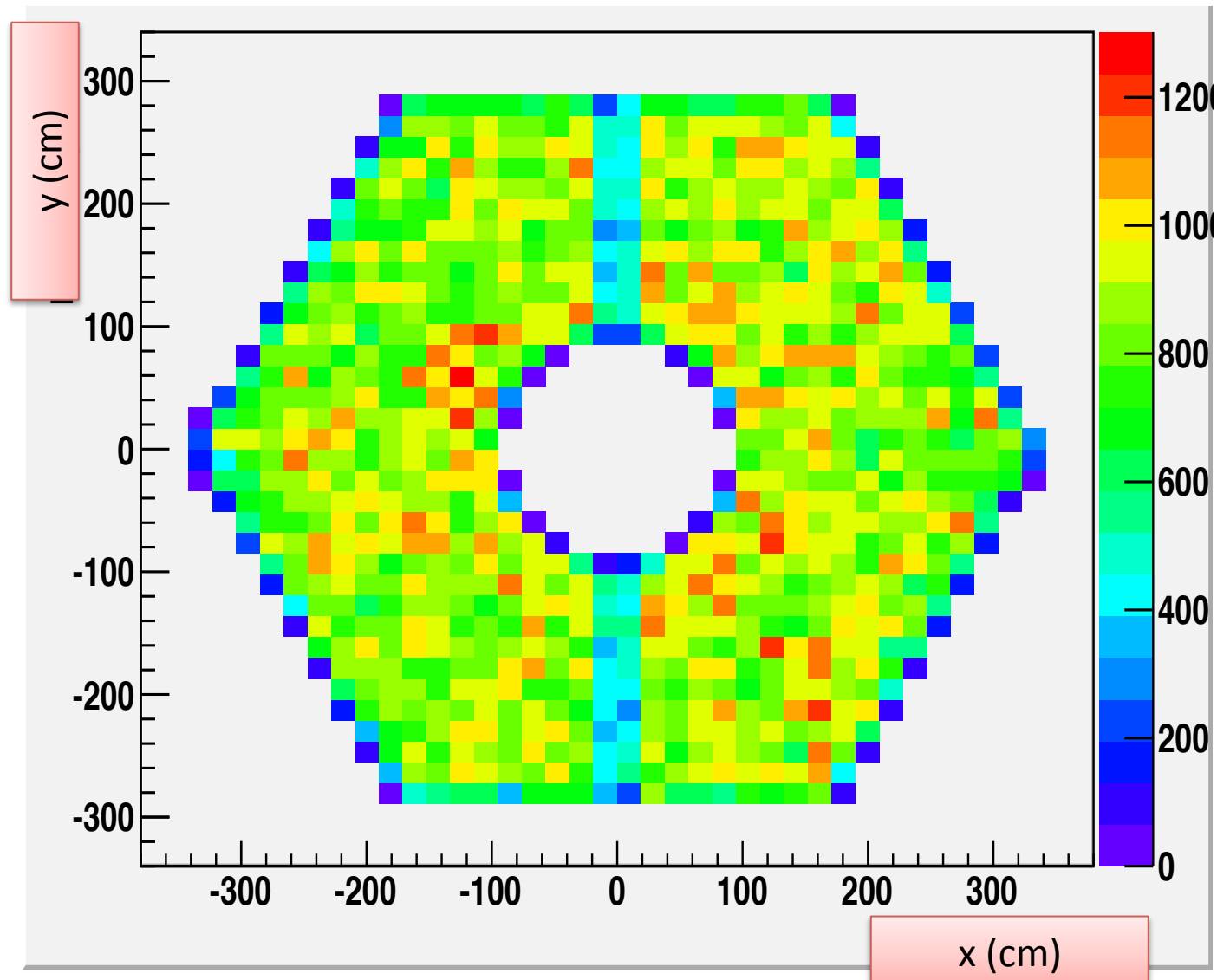
BACKGROUND STUDIES

Present layout of the IFR crates



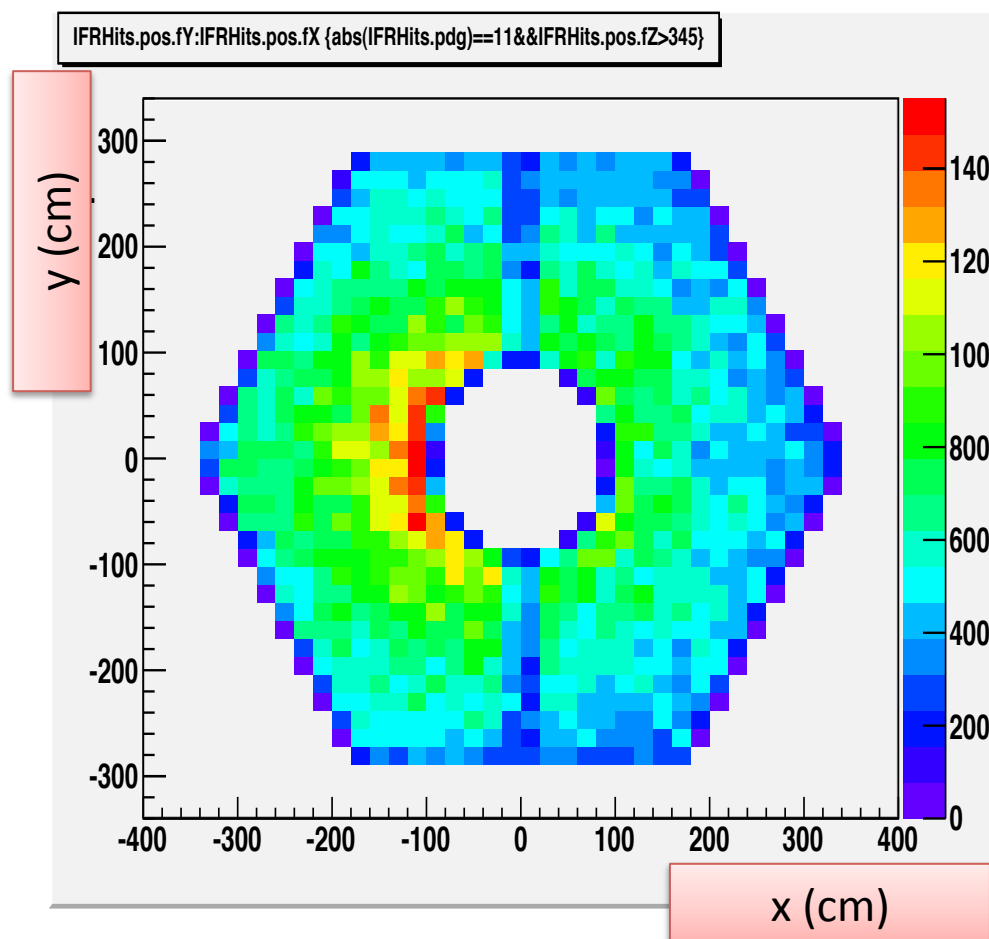
See Riccardo's talk for doses in the experimental hall: we need also to extract rates and expand the results to the photodetector locations.

Neutrons in the outer layer of the FWD endcap



Not only neutron background

- Electrons can be an issue for track reconstruction.
- We now have a well tested reconstruction code used either with MC and prototype data.
- We need to add background hits to real data and study its impact on the reconstruction efficiency and on muon ID performances.



Plans for future work (order of priority)

- Estimate FEE radiation dose.
- Give support to prototype simulation studies.
- Study neutron background on SiPM locations.
- Evaluate impact of background on reconstruction.