IFR Geant 4 Simulation

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Frascati, 16 December 2008

Outline

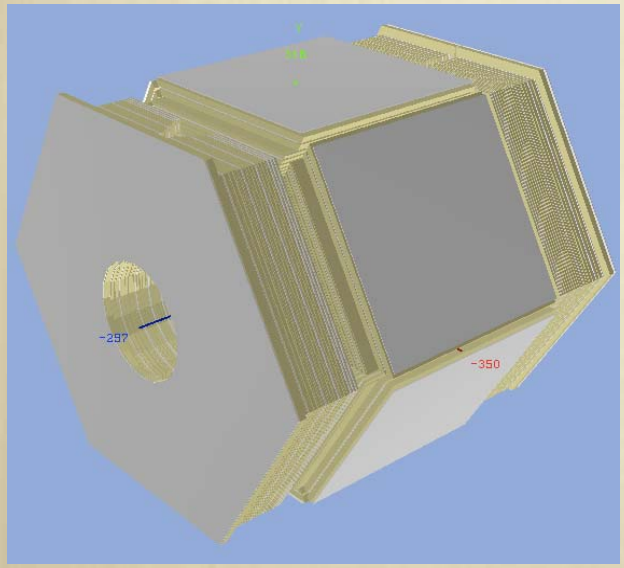
- **The IFR description:**
  - basics and features
- **Improvements since the Elba meeting**
- **Open issues**
  - Background simulation
  - Technicalities
  - Detector Geometry

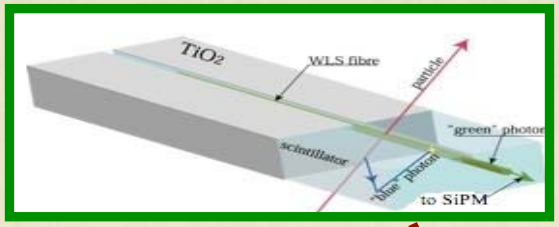
IFR G4 simulation: in a nutshel

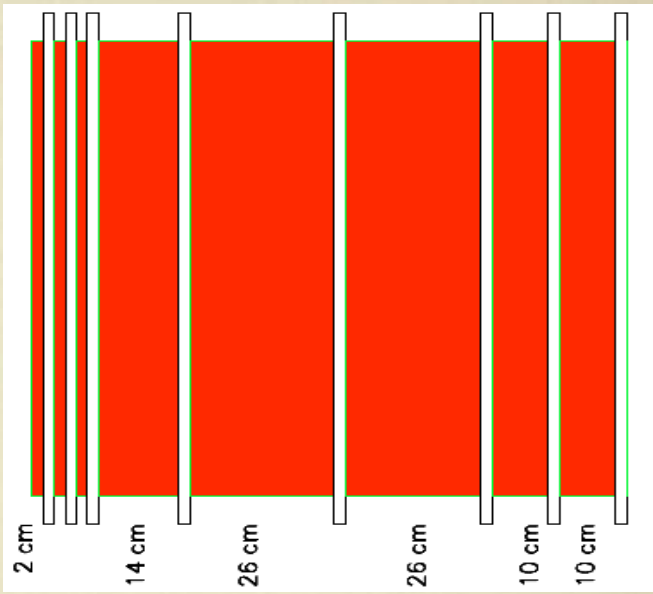
- Who: M. Andreotti, G. Cibinetto, M. Munerato, M. Rotondo.
- Where: Ferrara and Padova
- What: make a GDML description of the IFR, flexible enough to produce and test some different configurations.
- Why: use this description for the background events generation. Needed to understand background distribution on the detector for design and optimization.

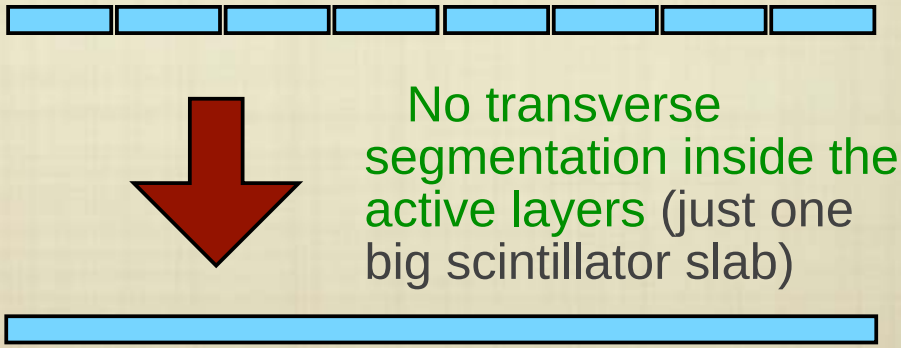
IFR G4 simulation Features

- The super B IFR is designed starting from the BaBar IFR, using the same iron structure and adding 8 active scintillator layers.



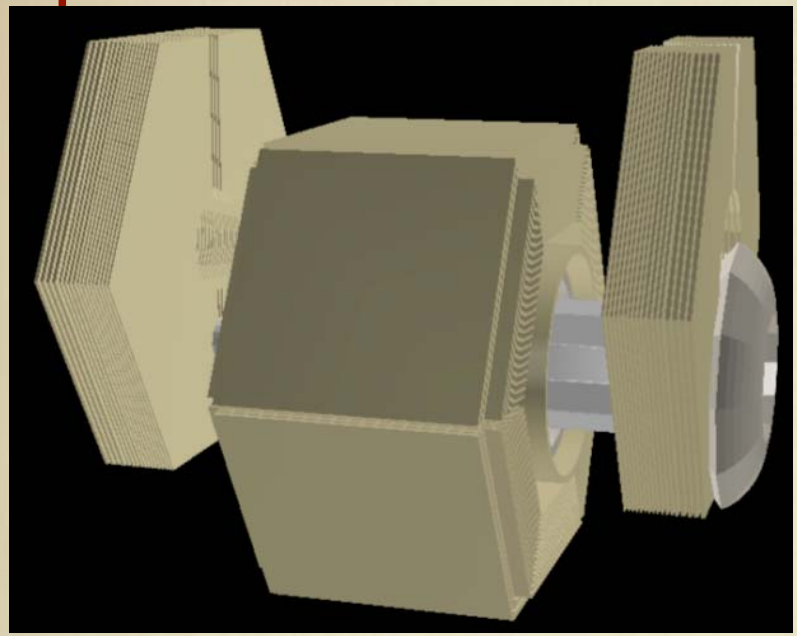




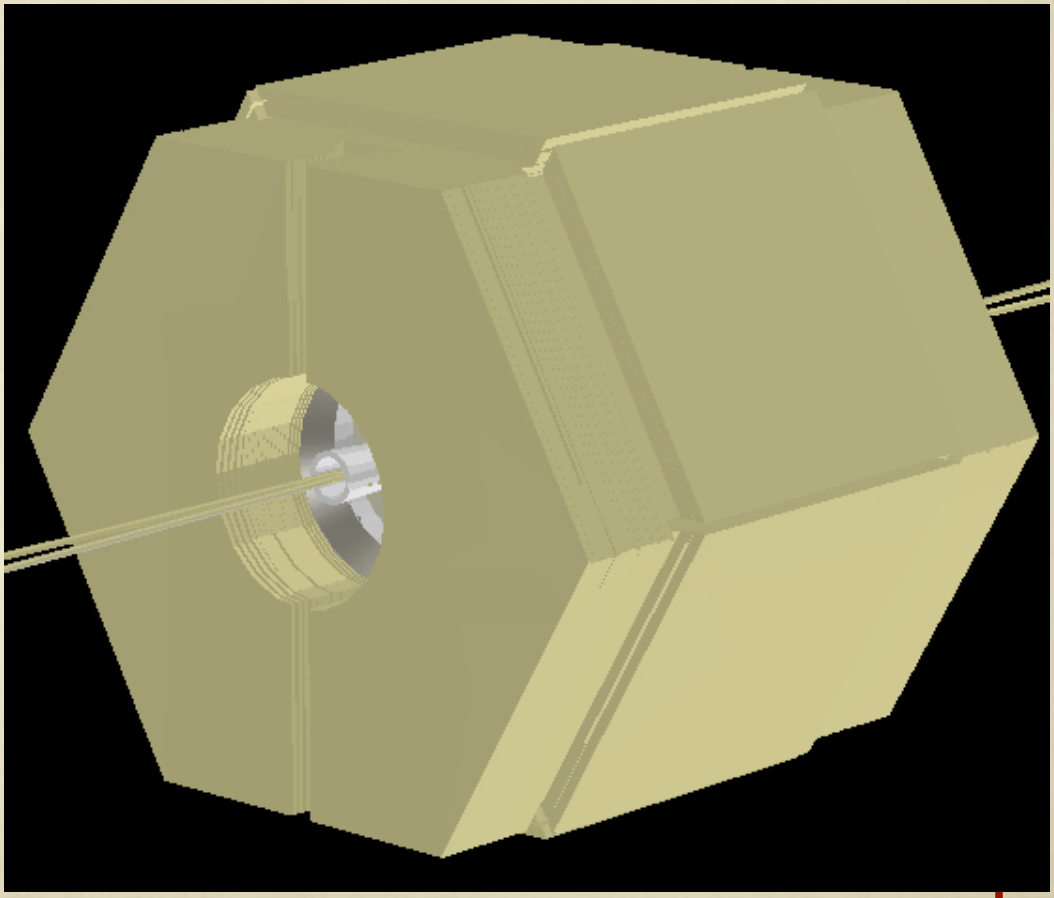


No transverse segmentation inside the active layers (just one big scintillator slab)

Setup improvement



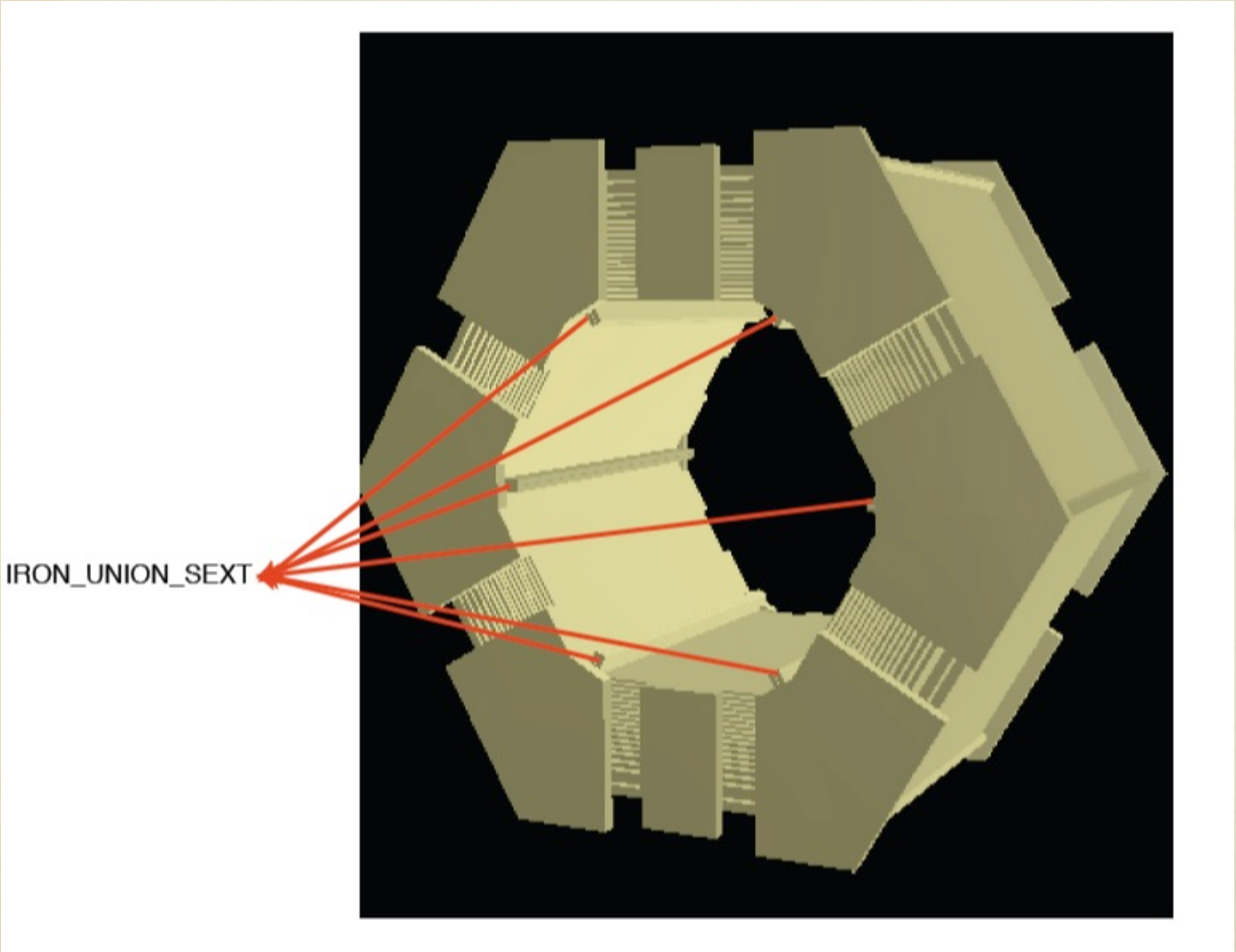
- At the Elba meeting the endcaps where misplaced.



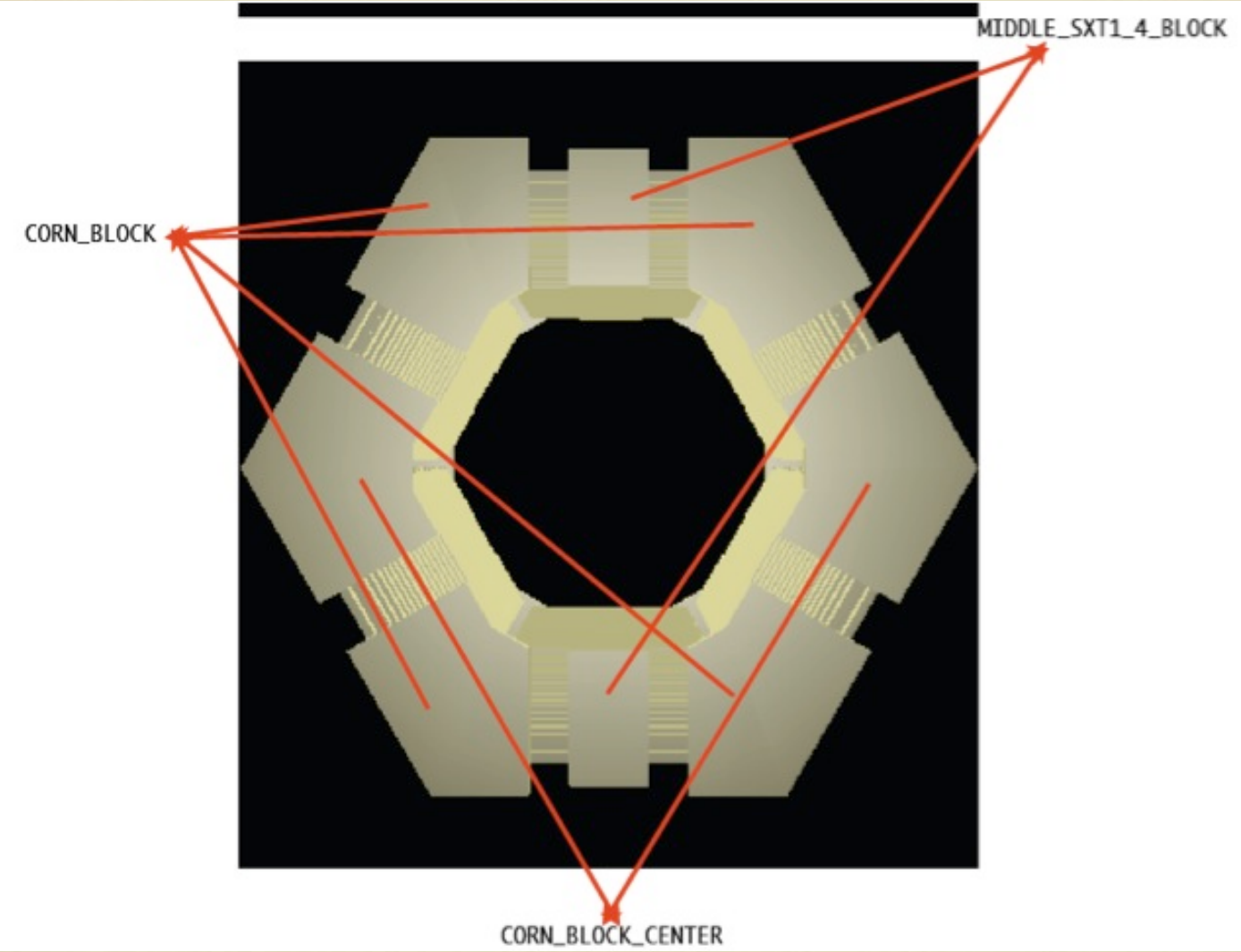
- This has been fixed by updating our framework and fixing some Bruno bugs.

Thanks to Mauro Munerato and Eugenio Paoloni

Description improvements (I)

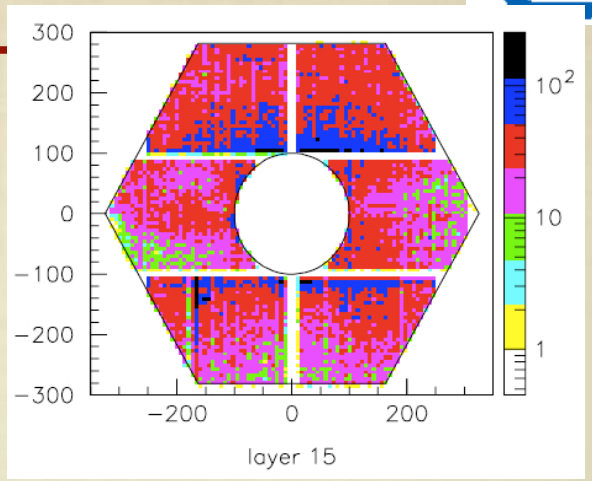


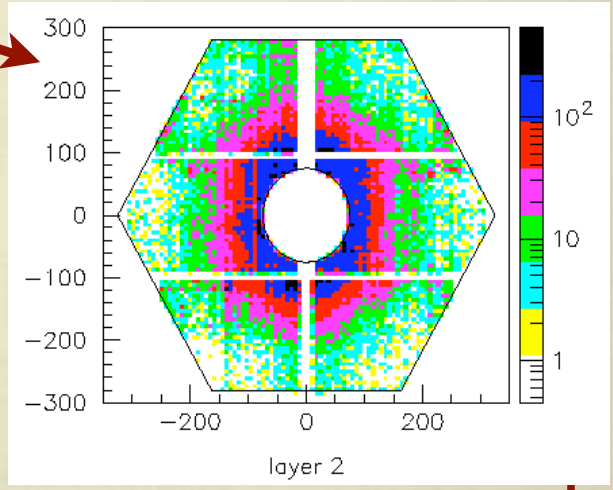
Description improvements (II)

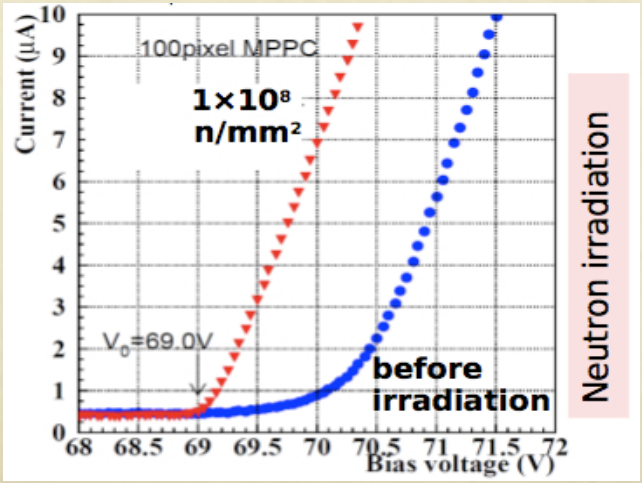


Main background issues

- Based on the Babar experience
  - Beam halo
  - Innermost layers around the beam pipe
  - Neutrons



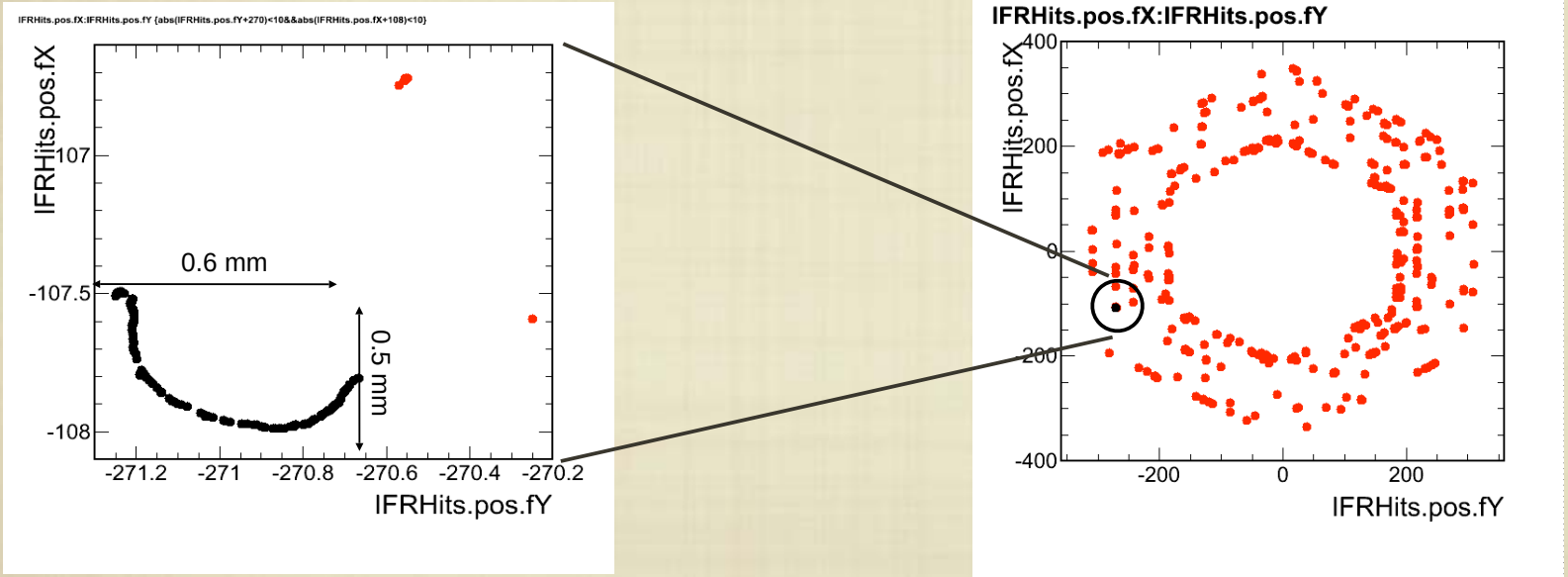




Technical Issues

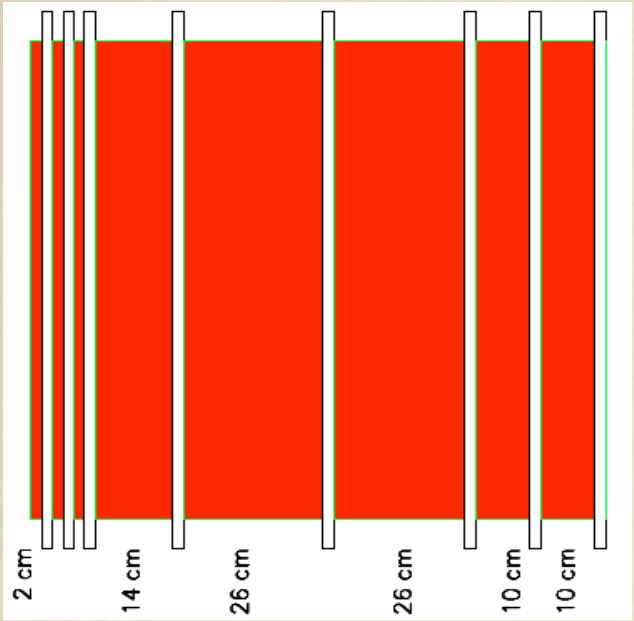
- We need a different granularity to extract useful quantities from the background rootuples.
- Hits info by layer is the option that has been proposed at the Elba meeting.

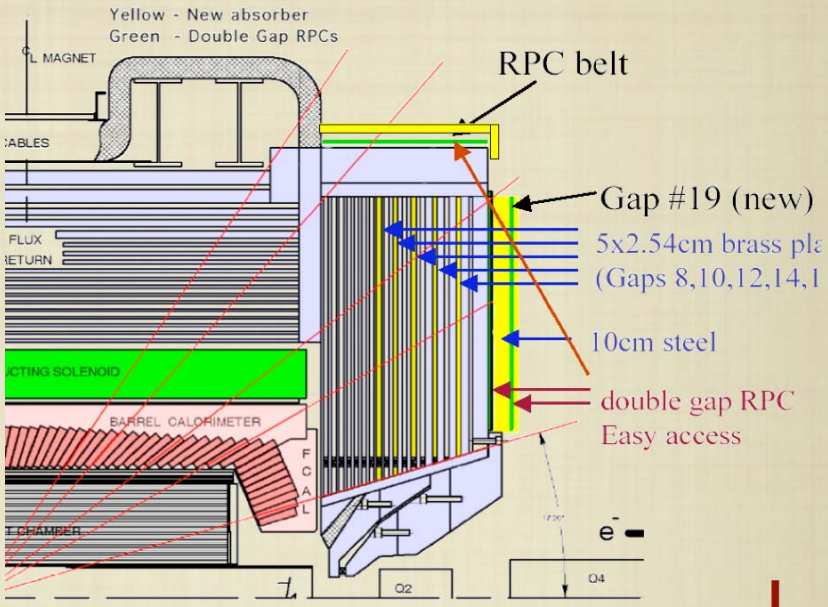
More than 150 ghits will be reduced to just one.



- A remote machine with the proper configuration will be also appreciated

Detector Geometry Issues





- How to adapt the BaBar IFR to the CDR design:
  - need of extra iron, iron vs brass, number of active layers, ...
  - Need of belt chambers.

Summary

- Now
  - Need to know the neutron rate distribution (Background group).
  - Different rootuple structure (Background group) .
  - Study background distribution on the detector (IFR group).
- Short term (few months)
  - Beam halo simulation (Background group).
  - Need of extra iron and number of active layers (Fast Simulation and DGWG)
  - Detector optimization studies (IFR group).
- Medium term (less than one year)
  - Improve IFR description based on the optimization results (IFR group).
- Long term
  - Fine detector optimization
  - ....