

Short summary of the Orsay meeting about the forward PID – forward EMC interface

Frascati SuperB workshop, December 2nd 2009

Nicolas Arnaud (LAL-Orsay)




- **Indico** webpage of the meeting: <http://indico.lal.in2p3.fr/conferenceDisplay.py?confId=926>
- Meeting held last Friday (2009/11/27) at LAL-Orsay
- **Attendance:** NA, Frédéric Bogard, Sandry Wallon (LAL-Orsay)
Stefano Germano, Michel Lebeau (Perugia)
- **Main goals:** establish contact between groups; identify major problems (if any);
define a common work strategy to move forward 😊

Meeting agenda

- **Introduction** (NA)
- Pictures from current **mechanical design for 'DIRC-like' TOF** (Frédéric + Sandry)
- Summary of **EMC Geant4 simulations** (Stefano)
- Status of the **forward EMC design** (Michel)

Lunch

- **Engineers' discussion** followed by a short summary



Réunion mécanique SuperB-PID

Friday 27 November 2009
from 10:00 to
18:00 Europe/Paris
at LAL, Building 200,
room 129
chaired by: *Nicolas Arnaud*

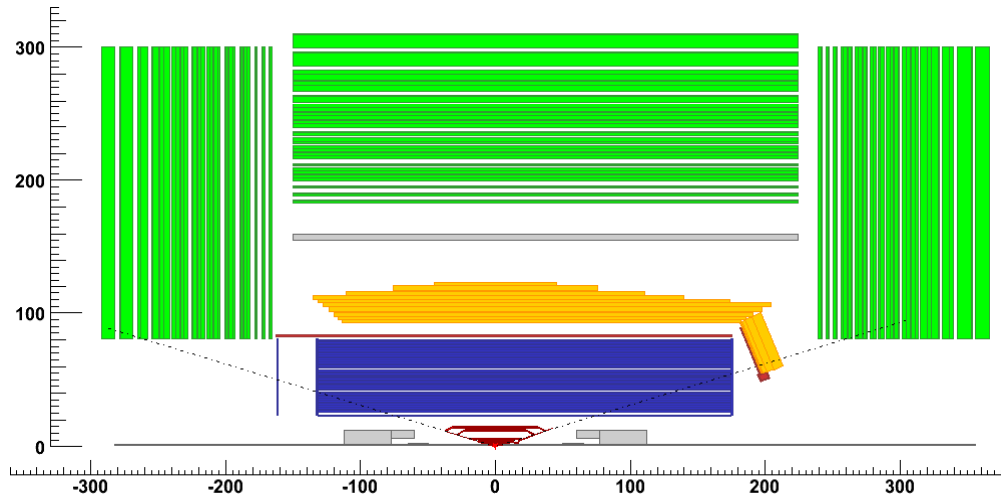
Description: Réunion mécanique PID-EMC

Phone conference: + 33 1 56 78 86 88

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10:00	PID documents (1h00') (Slides; pictures)	Sandry WALLON (LAL) , Frédéric BOGARD (LAL) , Nicolas ARNAUD (LAL) , Christian ARNAULT (LAL) , Achille STOCCHI (LAL)
11:00	EMC documents (1h00') (Slides)	Michel Lebeau (CERN) , Claudia Cecchi (INFN) , Stefano Germani (INFN)
14:00	PID-EMC Engineering discussion (2h00')	All
16:00	Outlook; short term plans (30')	All

'DIRC-like' TOF Detector





'DIRC-like' TOF detector

J.V., http://www.slac.stanford.edu/~jv/activity/Vavra_Forward_TOF_geometry.pdf, Perugia, June 2009

Part of a hexagon:

- Not all photons are of "equal" quality. Some we want to throw away because they are affected by the chromatic broadening.
- We do not want photons to rattle around for too long
- This design requires a high gain operation to detect single photons

Photon absorbing trap
1cm
track
~30 cm
polish
Calibration:
1 ASIC/16 channels

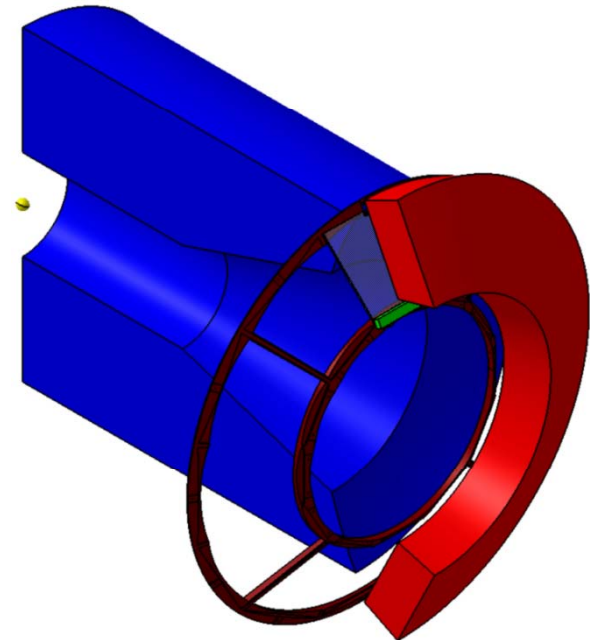
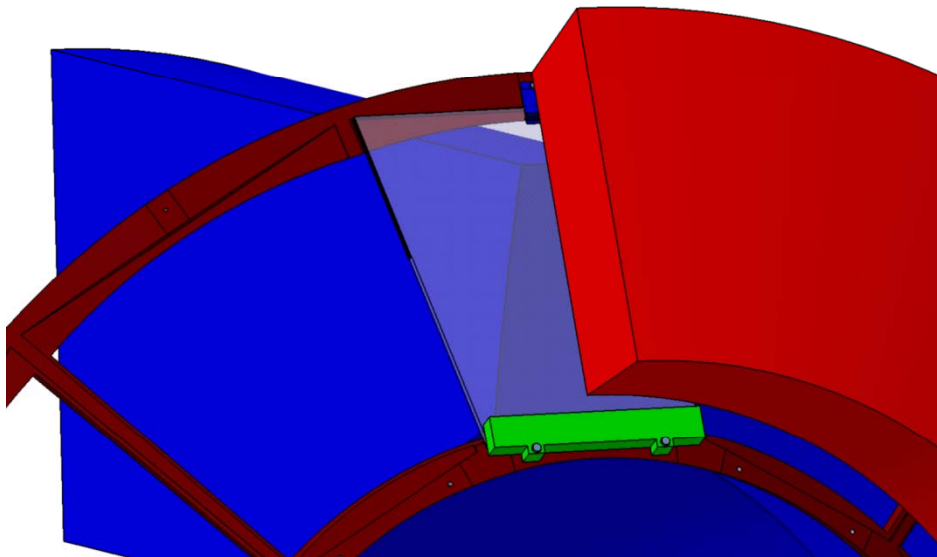
Hamamatsu MCP-PMT (SL-10) with strips and a protection foil:

 φ 10 μm holes

 20 effective area, 27.5mm

Time-of-Preparation:
 $TOP(\Phi, \theta, \lambda) = [L_{\text{photon path}}] / [v_g(\lambda)]$

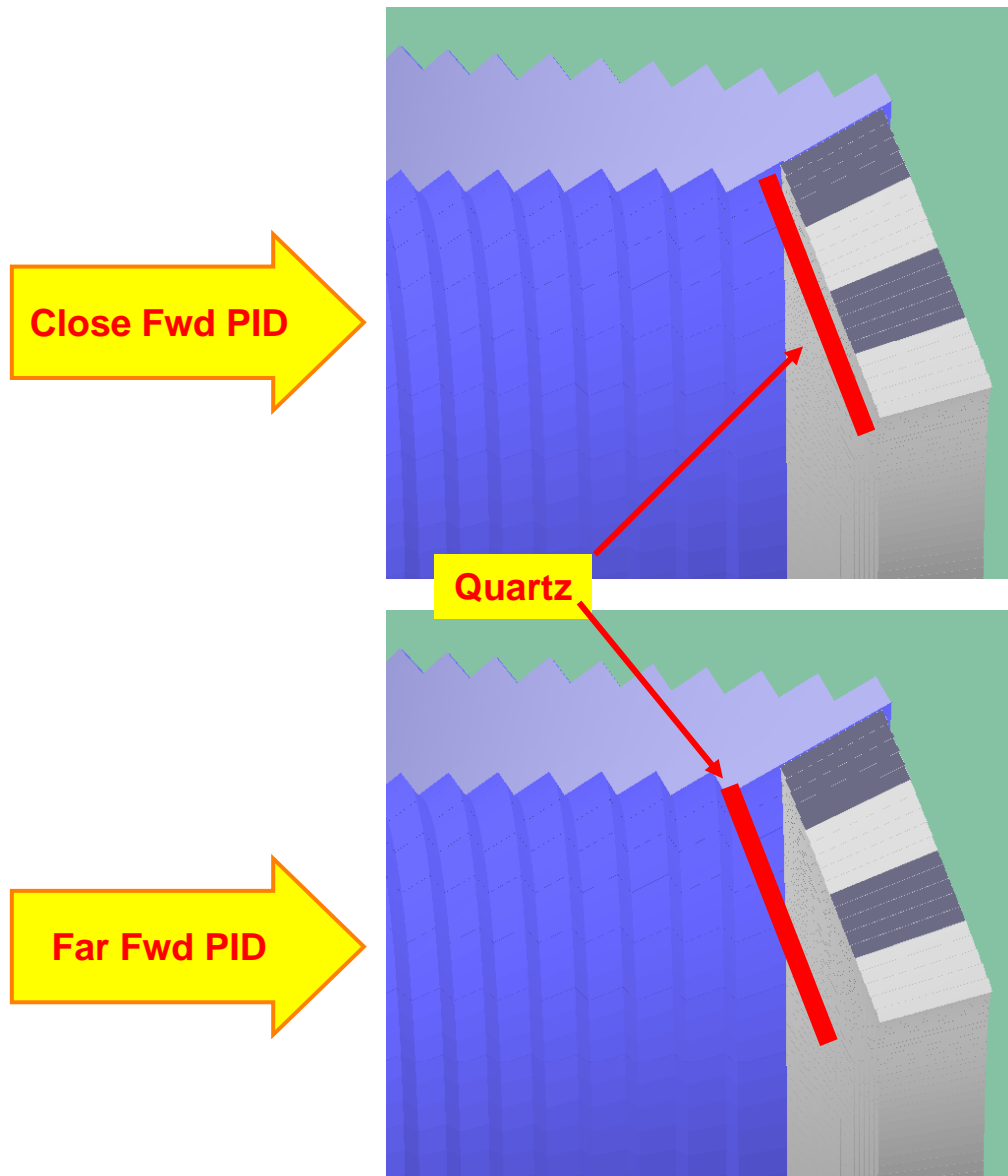
A direct photon is accepted only if:
 $TOP_{\text{measured}} - TOP_{\text{expected}} < \text{Cut}$

Even 3 photons will do as long as they are "good" photons

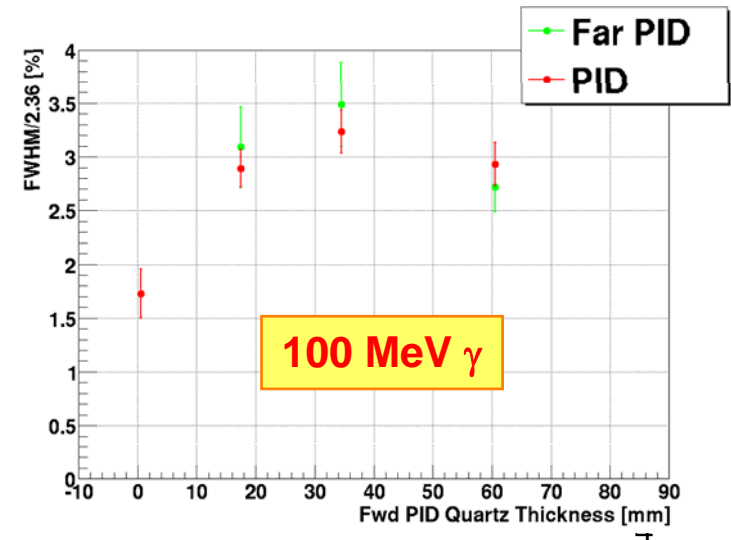
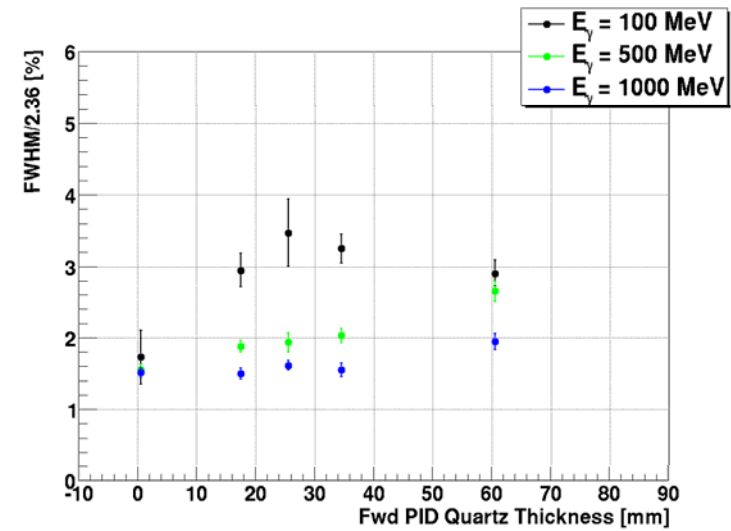
10/7/09
J. Vavra, Forward TOF update
4



EMC Geant4 Simulations



Resolution vs. quartz thickness



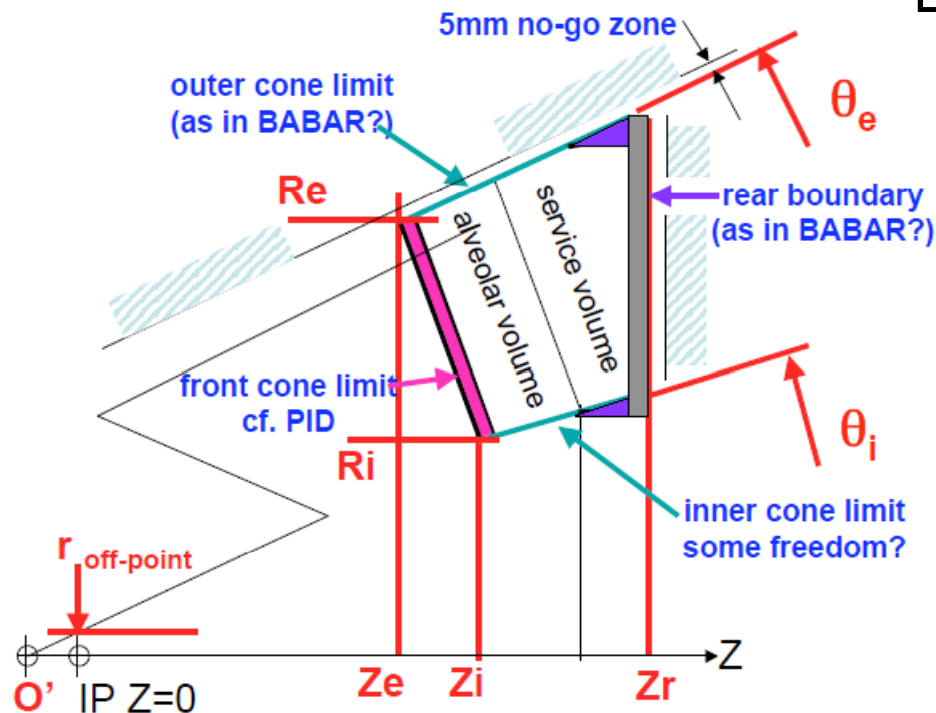
Photons close to forward EMC 'center'

Forward Calorimeter Design

- Michel Lebeau addressed several topics:

Summary

1. EMC crystal array
2. Support structure
3. Alveolar modules
4. Prototype module
5. EMC boundaries
6. Babar barrel-endcap transition
7. Installation tooling (re-use of Babar's)
8. EMC space for services



Outcome of the Engineers' Discussion

- **No showstopper** identified
→ 'DIRC-like' TOF detector very light and mechanically simple.
- **Agreement on a possible PID-EMC interface** design on the forward side
→ Sandry and Frédéric are updating their design accordingly.
- **Status report next week at Perugia group meeting** by **Michel Lebeau**
→ If no problem found, design will be made public.
- Forward EMC current priority is to **prepare a prototype for beam test early next year**
→ **PID should provide them a piece of quartz** to be put in front of the crystals in order to check the results of the Geant4 simulation.
- **Little manpower on both sides**
→ Working together to optimize resources is really the way to go.

