SuperB Detector R&D Workshop
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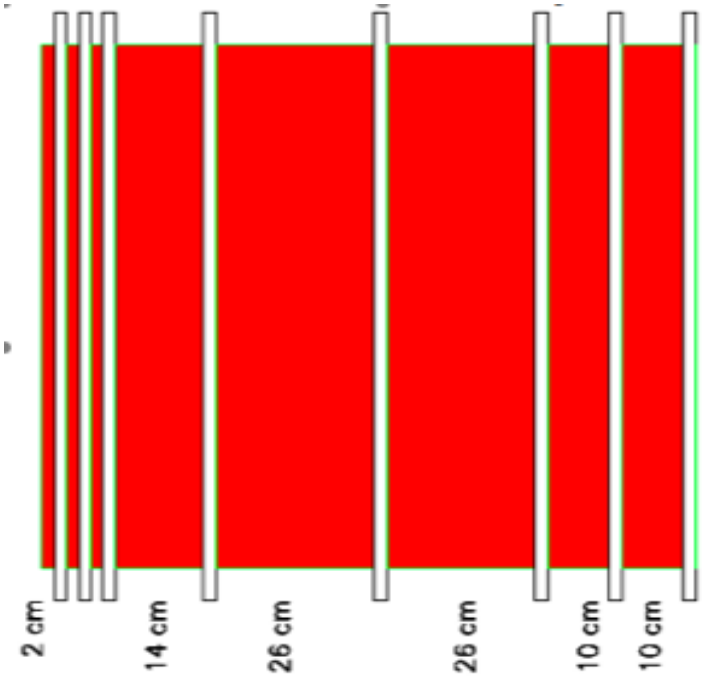
IFR fast simulation

Mirco Andreotti,Gigi Cibinetto, M.R.

CDR baseline

Baseline

- Add iron to BaBar stack to improve μ ID.
  - ➔ 7-8 detection layers.
- Re-use BaBar steel (still to be fully assessed)
- Keep longitudinal segmentation in front of stack to retain K_L ID capability.
- Backgrounds are problematic for gas detectors.
  - ➔ Use Minos style scintillation bars.

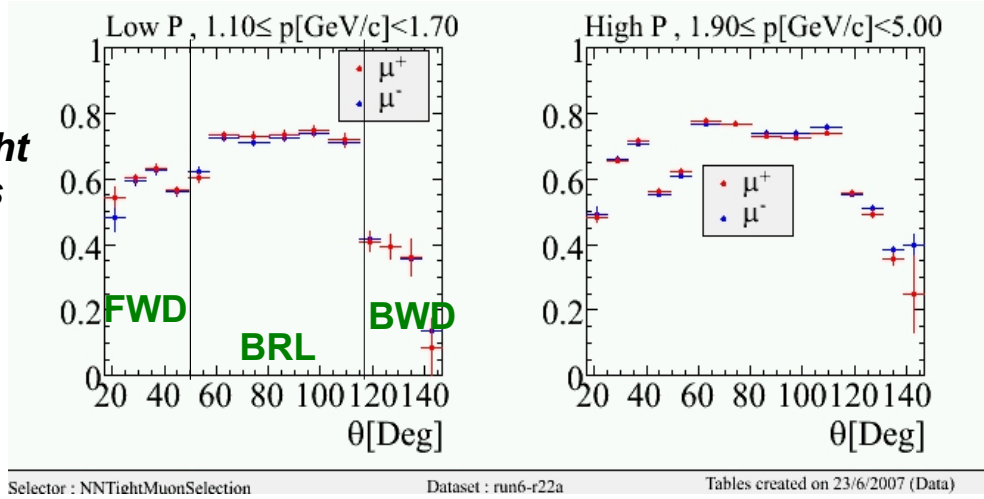


Fast Simulation

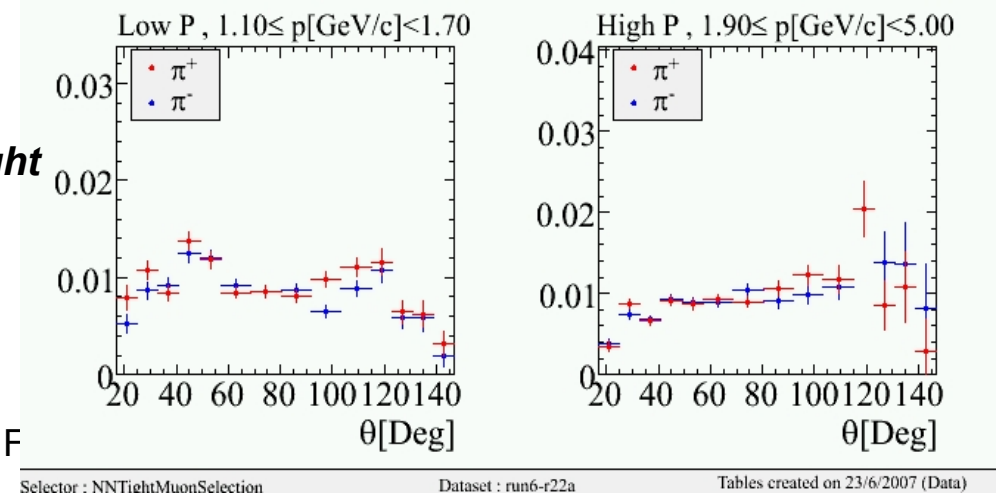
- *PravdaMC: the DIRC and the IFR are not described*
- *At present: the overall PID efficiency/mis-ID is given using the BaBar PID tables (ASCII files)*

- ***Order 0:***
  - *Redo the tables with reasonable guess on the mis-ID and efficiency*
  - *Use the estimated inefficiency (parameterized in P,θ,ϕ) obtained from the detector optimization studies*
  - *(equalize the FWD and the BWD parts)*

NNTight muons

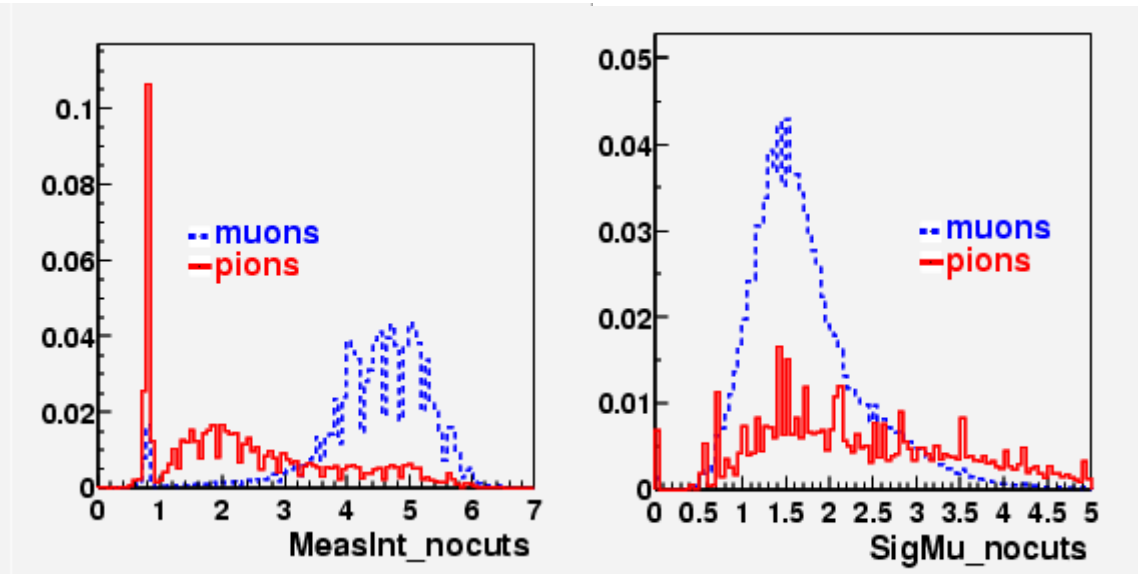


NNTight pions



Fast Simulation

- ***Order 1:***
  - *A parameterized output can be easily provided in Pravda, using the existing reconstructed output from BaBar IFR reconstuction, for example:*
    - *N-Interaction lenghts*
    - *hit multiplicity x layer*
  - *Run the (almost)standard muon selector on these quantity*



- Advantages: *implicitly these PDFs parameterize the hadron showers;*
- These PDFs need to be changed according to the full simulation or using reasonable guesses;
- The effect of the background can be propagated to these PDFs according to the detector optimization studies

Preliminary conclusions

- *To implement a reliable Fast Simulation a detailed parameterization of the hadronic showers and the inefficiency due to the background is :*
  - *important for μ/π separation, and crucial for the K_L identification*
- *The inefficiency due to the bkg, parameterized as a function of (P,θ,ϕ), can be used in a Fast Simulation (PravdaMC Stile)*
- *The IFR fast simulation with Pravda can be done at different level of details*
- *Many analysis studies does not crucially depend on the IFR details*