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IFR Simulation Detector Optimization

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IFR geometry for the Super B

- A first SuperB IFR configuration is available in PacSim
- According to CDR:
 - Reduced number of active layers to 8
 - More # of Interaction lengths (6.5-7.5 instead of 5-6 we have now in BaBar)

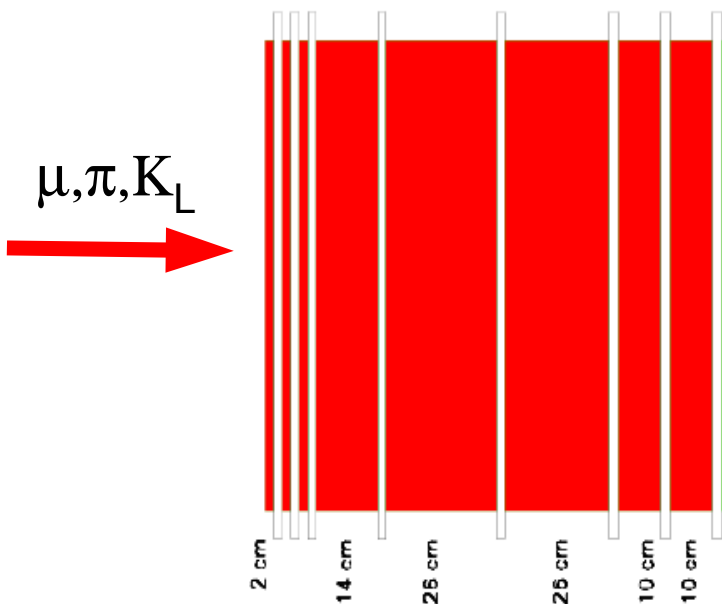
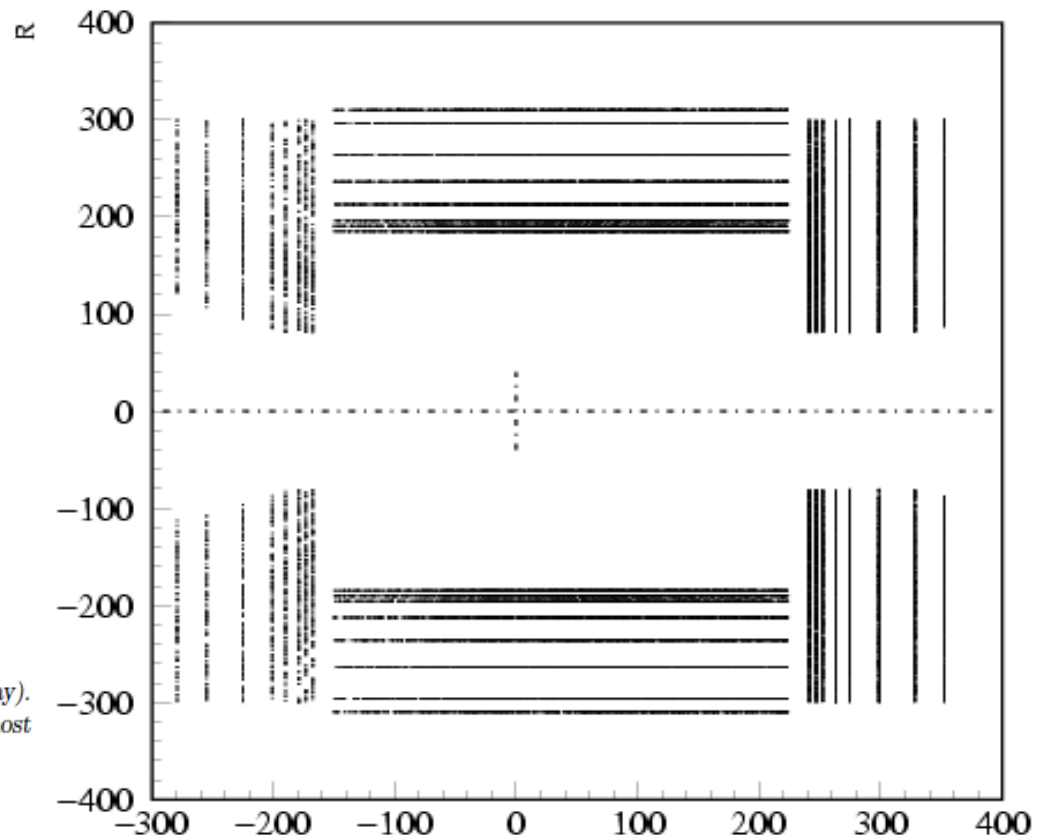


Figure 4-41. Sketch of the longitudinal segmentation of the iron absorber (gray). Active detector positions are shown in white from the innermost (left) to the outermost (right) layers

- Cylindrical geometry:
 - N-agon will be available in the next future
- Outside the coil the magnetic field is modelled with a 0-Field
 - Tracks in the IFR are straight lines



IFR: parameters to be optimize

- *Detector, parameters that need to be optimized:*
 - *# of interaction lengths*
 - *Spatial resolution, baseline is 4cm x 20cm*
 - *Transverse segmentation: better identify the neutral hadrons*
 - *Explore the possibility to have a cylindrical active layer outside the EMC*
 - *Background studies: require the full sim, can affect the Geometry of the scintillator slab (spatial resolution)*

IFR: Detector Optimization

- *It is not possible to use only the Fast Sim. for the IFR detector optimization*
 - *The hadronic interaction at low momentum, crucial to π - μ separation*
 - *particularly lateral and longitudinal development of the shower require detailed studies*
 - *The same for Neutral Hadrons*
- *Timescale of the DGWG are short: **end 2009**. A complete Full Sim. will not be ready in time:*
 - *Digitization, patten recognition, tracking...*

IFR: Detector Optimization

- *Use the Full Sim. geometry only to study the shape of the hadronic shower in a sampling detector*
 - *Parameterize the shower with a functional form in the Fast Sim.*
 - *This is crucial for the Fast Sim itself, but could be used to optimize the detector geometry*
- *Integrate the output of the Full Sim in the Fast Sim? GHits hadrons in the IFR active layers can be treated as PacSimHits?*
 - *Is it possible this kind of integration, how can be implemented in short time Scale?*
- ***Any better idea or suggestion?***
- *This kind of studies require to involve the Full Sim. WG*