EMCAL updates
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• Calorimeter transverse size
  – Monolithic if 60x60 cm²
  – No problems with larger transverse size: modular structure

• Readout cell size
  – Fixed to 4.0x4.0 cm² by hardware constraints

• Optimization (longitudinal)
  – Pb layers of 0.2 0.3 0.5 mm and “mixed”
    – “mixed” = 0.5 mm in 1st Layer and 0.2 mm in Layer 2-3-4

• e/µ separation algorithm
  – Efficiency and contamination vs momentum
Some open questions…

• Transverse beam profiles at calorimeter front face have been computed by Yagmur…
  …however….

• The calorimeter appears to be sharply cut by a 30cm radius cylinder in G4MICE(v7r0) !!!!
  – The reason is not clear… Yagmur and I are investigating, and checking on G4MICE-v9
  – Exact definition of calorimeter transverse size is not yet possible will come as soon as we can implement final layout of magnetic shielding, TOFs, Ckov etc.
Muon spectrum at calorimeter

Datacards used:
\( \langle E_{\text{kin}} \rangle = 120.5 \text{ MeV} \)
\( \Delta E/E = 0.1 \)
Lead absorber thickness

Eff. for signal>threshold in 3rd or 2nd layer vs momentum
(useful mainly for trigger purposes)

- 0.5mm cause too large loss on 3rd layer
- Eff. on 2nd layer is close to 100% even for softer muons (small sample...)

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e/µ separation algorithm

Apply cuts on
Baricenter coordinate and E1 vs E1/Etot

\[ Z_B = \frac{\sum_{i=1}^{N_{\text{lay}}}}{\sum_{i=1}^{N_{\text{lay}}}} Z_i \times PH_i \]

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- Comparable efficiency with all the sampling options
- Fraction of electrons surviving the cuts is 10-15%, except with very thin Pb layers

ONE CAVEAT: Pb fraction turns out to be larger than the nominal one, because of the the machining technique: we prefer to choose thinner layers

Our favourite choice at the moment: Pb layer thickness 0.3mm

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