Simulations update

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Since last meeting

- More data produced (using non-projective SDNPHJun04 geometry)
  - Check robustness (one more bug found & fixed)
  - Data available for studies (same data as SDJan03)
- Some work on LCDG4 documentation
- MIP comparisons: LCDG4, LCS, TBS, TBMokka
- Lccomponents (Jeremy)

More samples for general use

- Now available in both SDJan03 and SDNPHJun04 geometries:
  - 2K each of $e^{\pm}$, $\mu^{\pm}$, $\pi^{\pm}$, γ, n at $\theta = 90^{o}$ and flat in φ
    energies = 2, 3, 5, 10, 15, 20, 30, 50 GeV
  - 5K 10 GeV K_s^0 into $\pi^0\pi^0$
  - 10K 10 GeV K_s^0 into $\pi^+\pi^-$
  - 5K 10 GeV Σ^+, inclusive decays
  - 5K 1..10GeV Λ^0, inclusive decays
  - 10K Z into (hadrons) at 91 GeV
  - 5K ttbar inclusive at 350 GeV
  - 10K WW into (hadrons)(any) at 500 GeV
  - 10K $\tau^+\tau^-$ at 500 GeV
  - 4K ZH into (any)(bbbar) at 500 GeV and M_H=120, 160 GeV (2K events each)
- The samples are available via sftp:
  scpuser@k2.nicadd.niu.edu (password=lcd_2004): /pub/lima/lcdg4/v03-06/

MIP checks

- Rob started to look into this using LCDG4 and TBMokka
  - SDJan03 cal layerings, Geant4.6.2, range cut, materials, physics lists
  - Look at layer deposition (segmentation does not matter)
  - Found slightly different MIP energies for same thickness of sensitive material (ECal and Hcal)

SDJan03 Calorimeter layering

EMCal

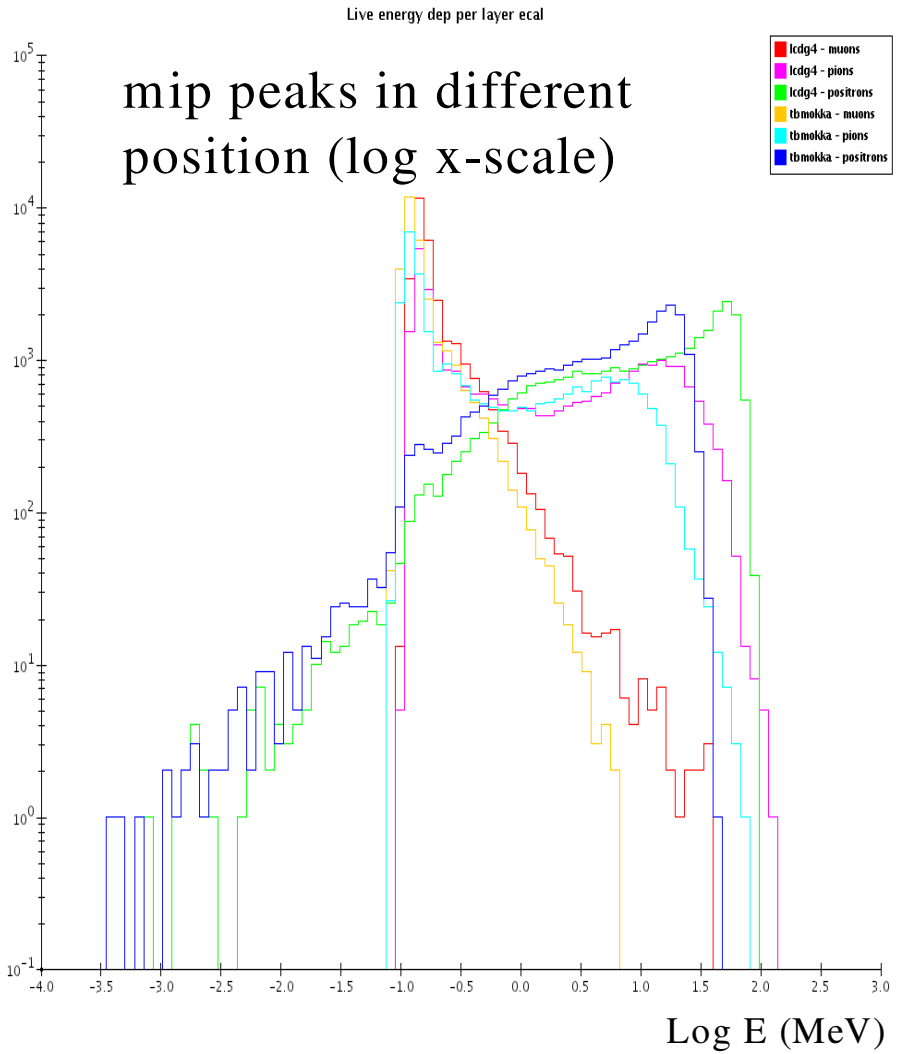
Slice Material	Slice Width (cm)
W	0.25
G10	0.05
Si	0.04
Cu	0.1
Air	0.06

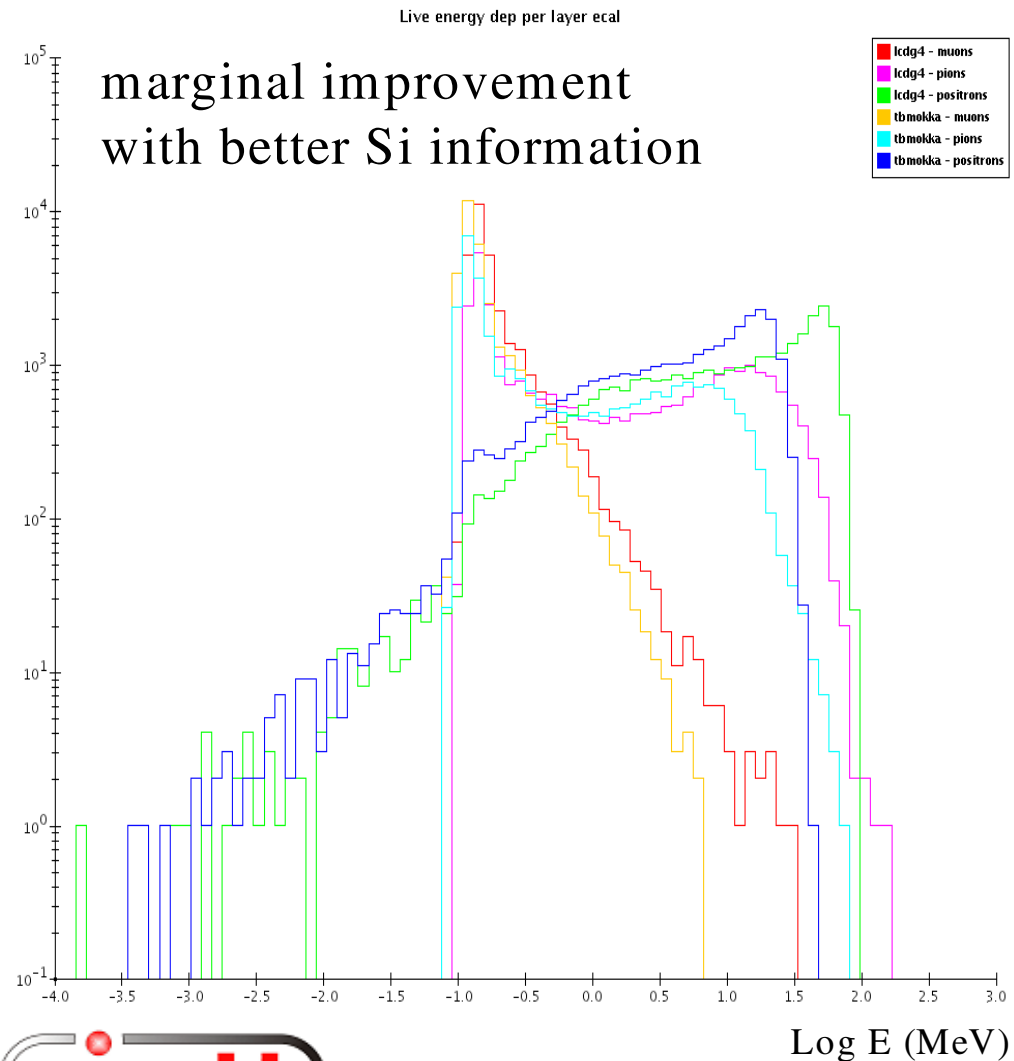
HCal

Slice Material	Slice Width
Polystyrene	0.5
Stainless Steel	2.0

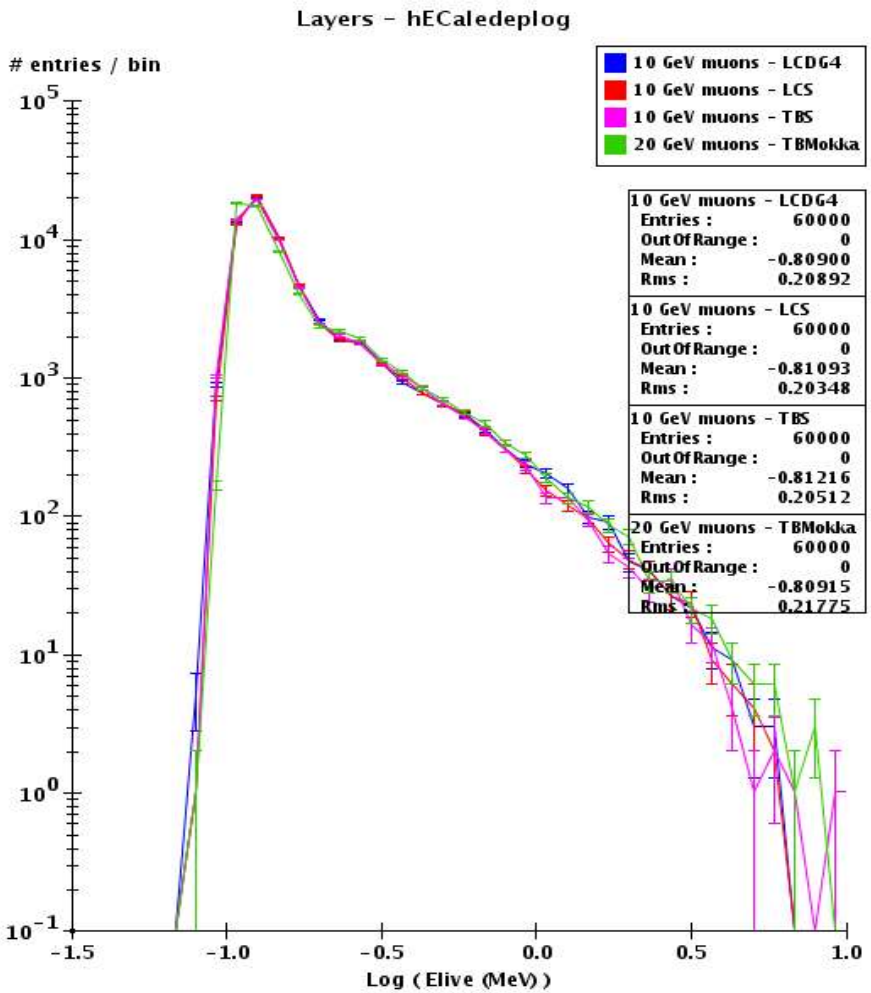
- Rob created a modified XML detector, with only calorimeters, and inner radius =100cm

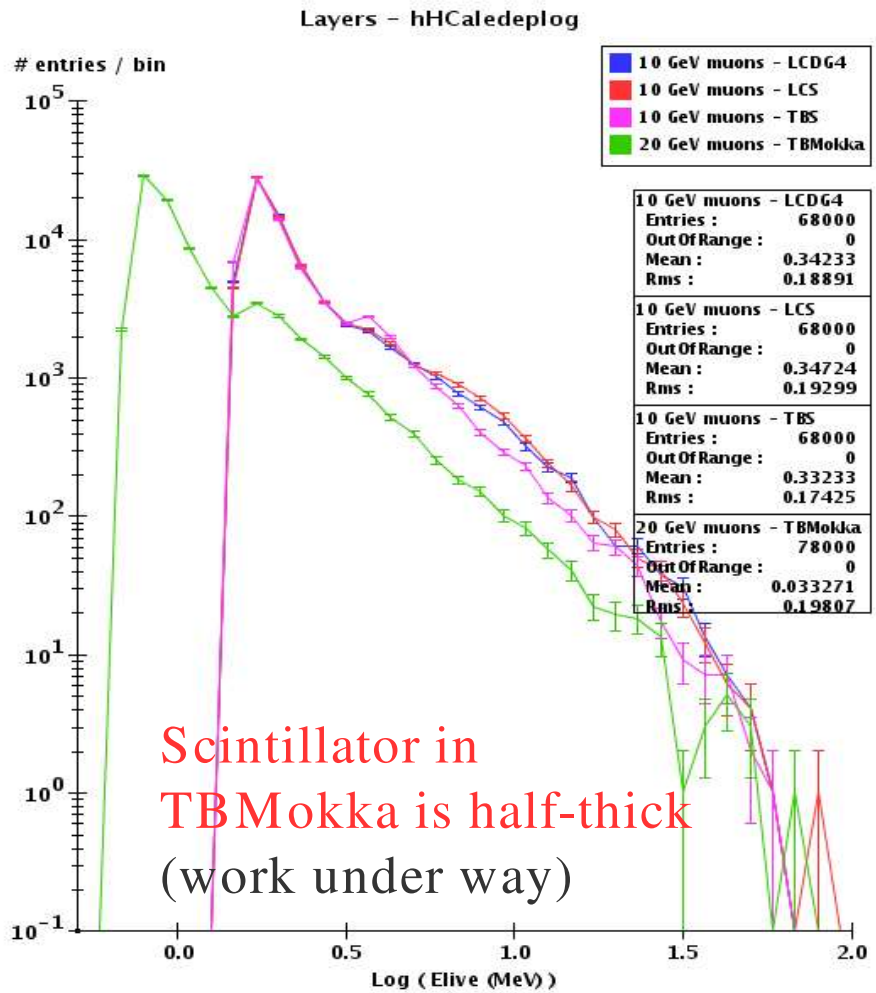
20 GeV pions, positrons, muons





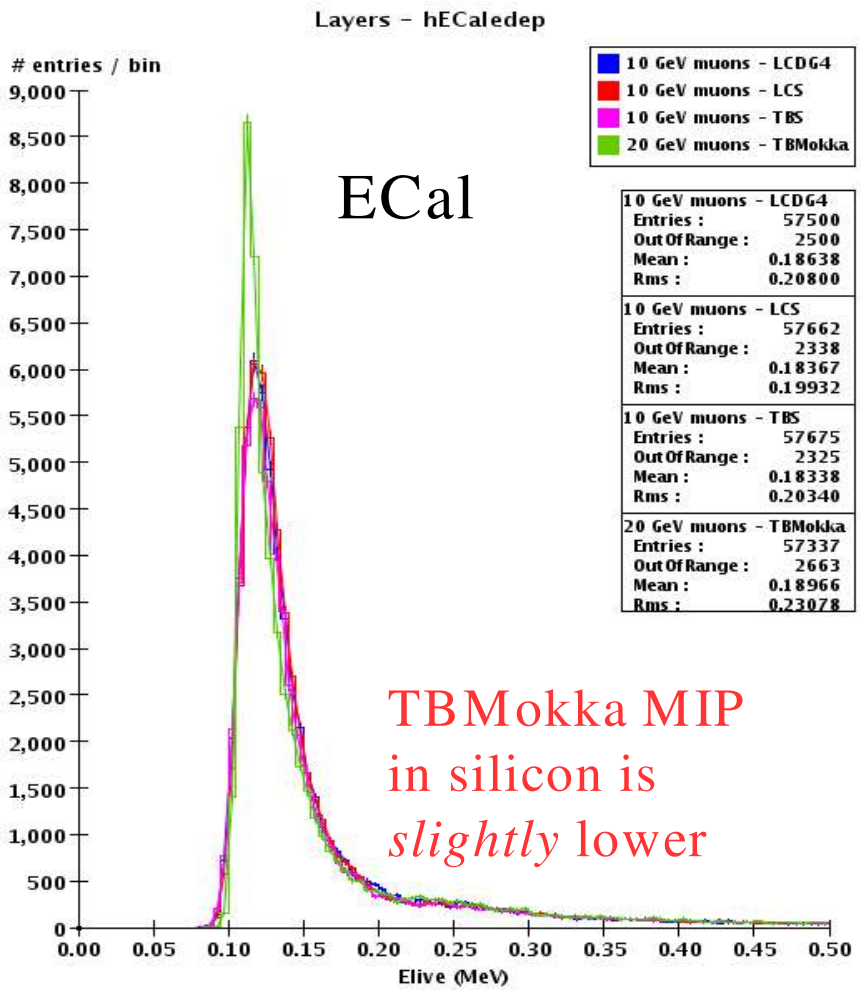
Muon MIP peaks for several packages

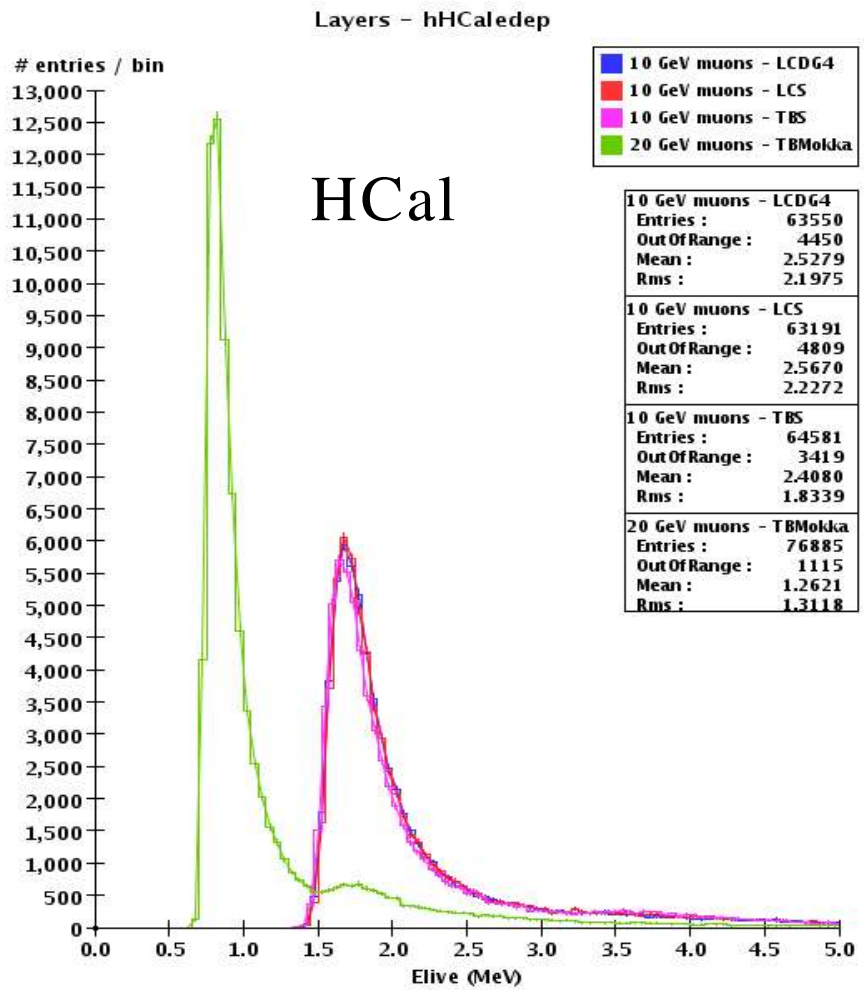




Scintillator in TBMokka is half-thick (work under way)

Comparing Elive/layer from several packages





Plans

- Development of a “DAQ simulator”:
  - process output from detector simulation, and produce raw data files (energy depositions ⇒ ADC counts)
  - should allow parametrization of inefficiencies, noise and non-uniformities
  - test beam tools as first implementation
- Effects of decays in flight on PFA performance
- MIP peaks (lower priority)