

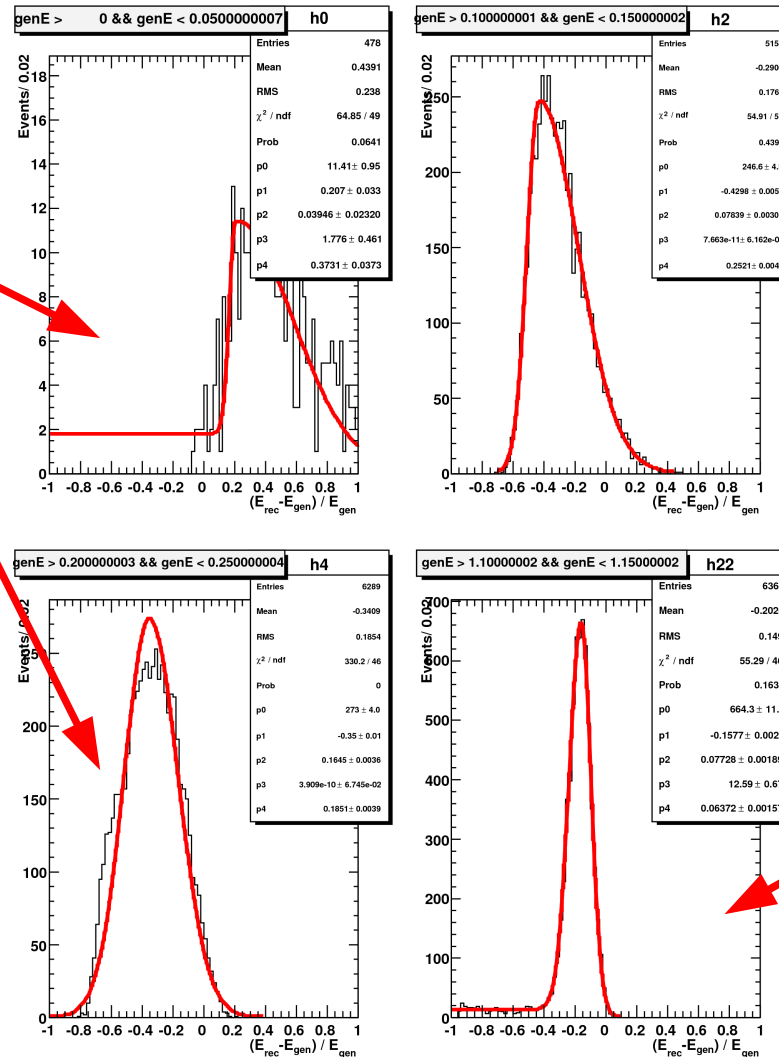
Study of *Bcal* Segmentation with *Bcal* Reconstruction Code

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- **Code came from IU (Dan/Matt)**
- **In our simulation, we used higher statistics (5000 photons per 1-cm bin of Z) and improved fits of the spectra**

Fit: Asymmetric Gauss + Left-Side Level

Low-Energy Bins
(NB: low Statistics)



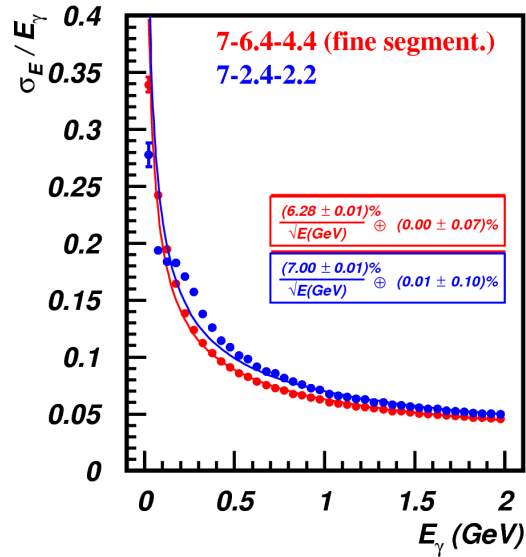
High-Energy Bins

PRO: Stable spectra fits allow to compare “summed-cells” readout with the “fine” segmentation data

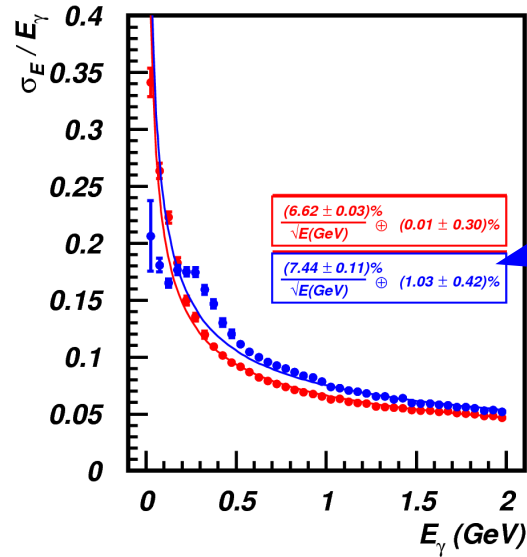
Energy Resolution (2-Terms Fit)

2011/02/16 17.26

Whole BCal (-70cm to 350cm)

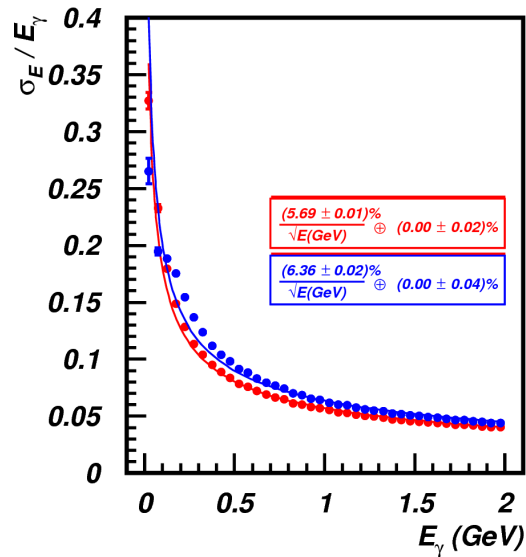


Near part of BCal (-70cm to 30cm)

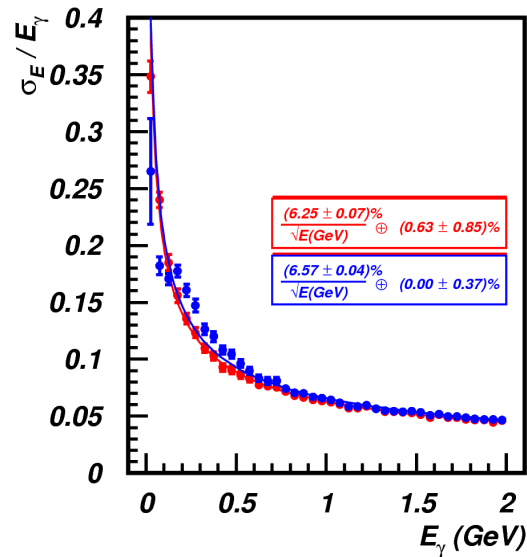


2-Terms fit underestimates the data for “summed-cells” readout
(Note ~7.5% “statistical” term)

Mid. part of BCal (30cm to 250cm)



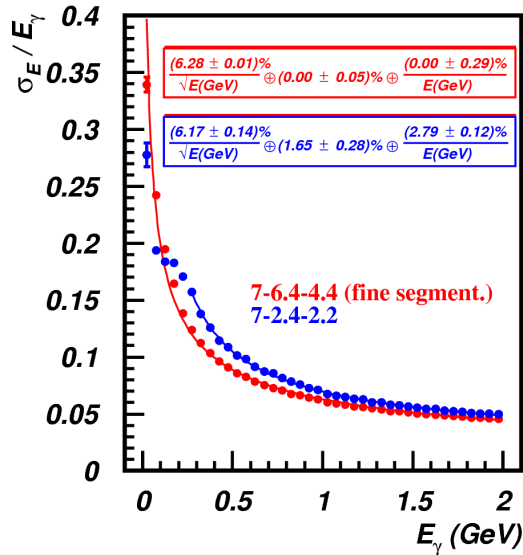
Far part of BCal (250cm to 350cm)



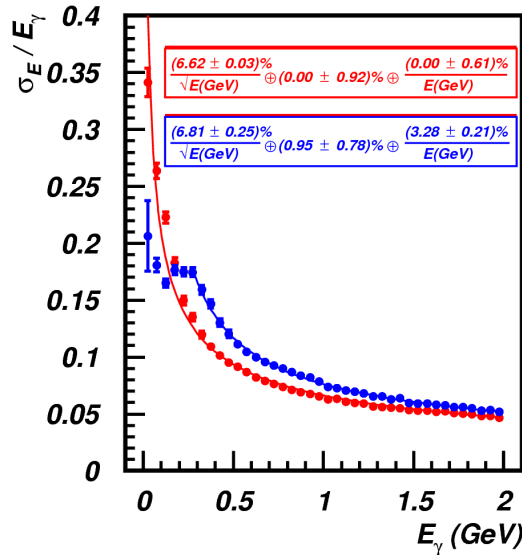
Energy Resolution (3-Terms Fit)

2011/02/16 17:21

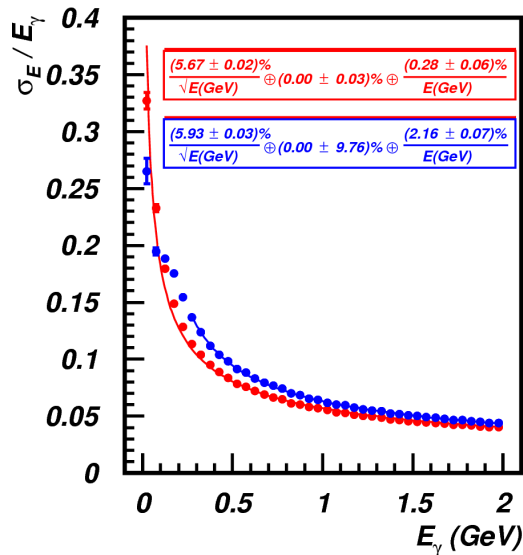
Whole BCal (-70cm to 350cm)



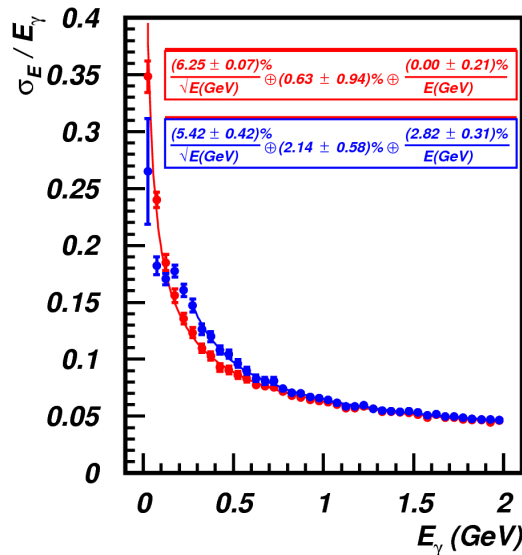
Near part of BCal (-70cm to 30cm)



Mid. part of BCal (30cm to 250cm)



Far part of BCal (250cm to 350cm)



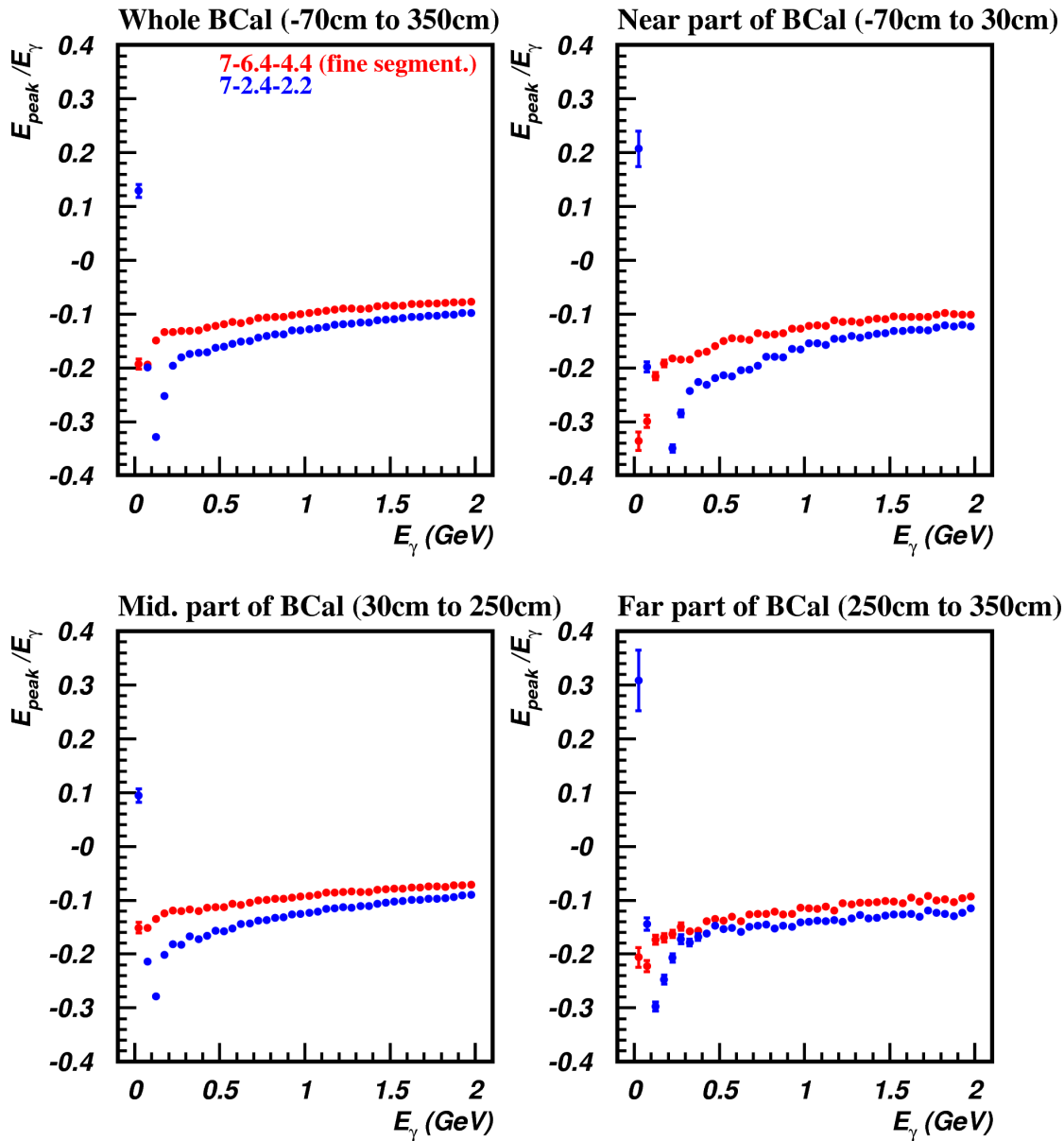
Almost no “1/E” term for the “fine” segmentation

Significant “1/E” term for “summed-cells” readout

Resolution for “summed-cells” readout is visibly worse than for “fine” segmentation

Peak Position

2011/02/15 17.10



**Significant deviation from
Blake's calibration might
Indicate big extra-loss of
collected energy**

***Effect is much bigger for
“summed-cells” readout
that is expected for higher
noise and thresholds
(origin of worse energy
resolution?)***

Conclusions

- **“Summed-cells” readout worsen significantly Bcal energy resolution (20-30% or more in the energy range below 500-700 MeV)**
- **Big “ $1/E$ ” term in the resolution (most probably) indicates the energy loss (fluctuations) because the injected noise and applied thresholds**
- **More study is expected**