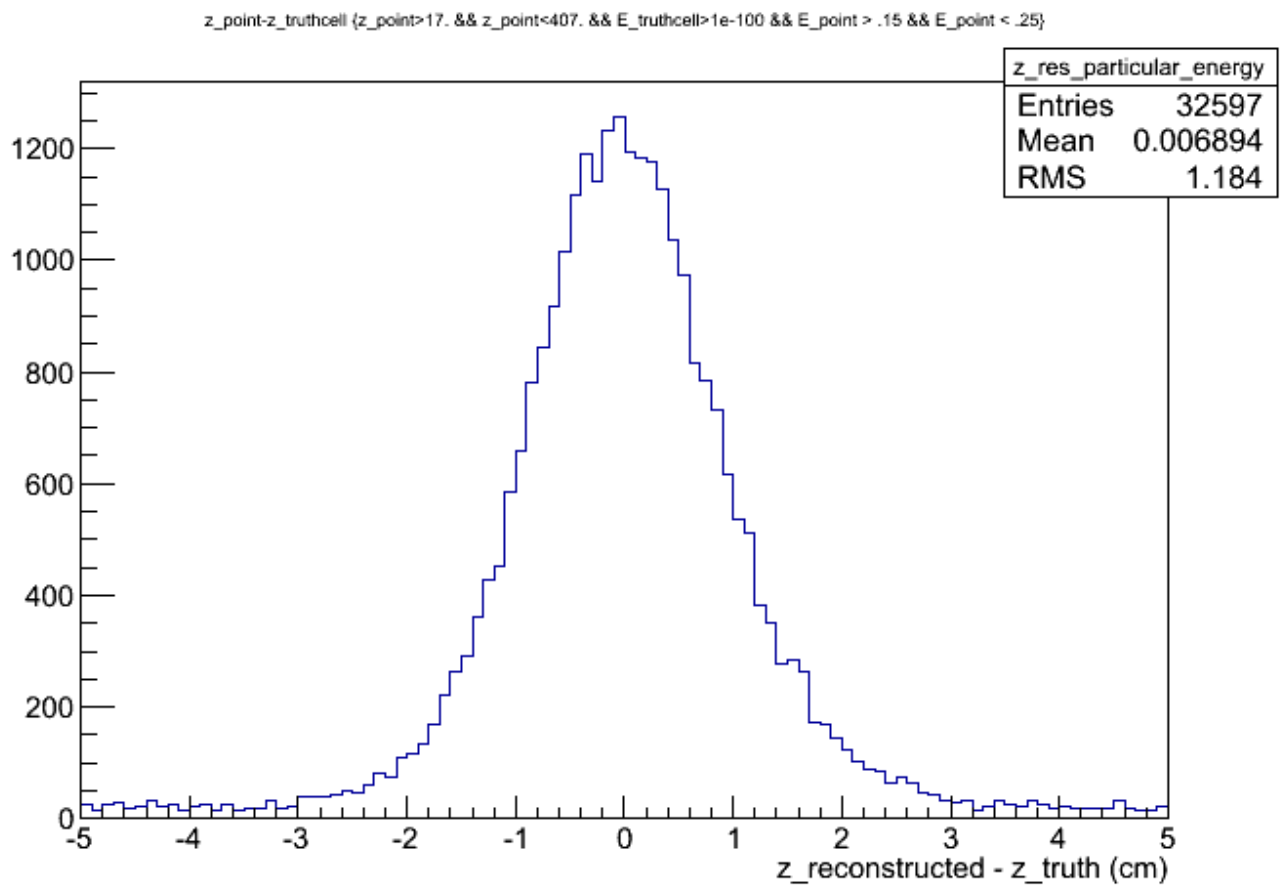
Z resolution

- Truth information from HDGeant gives information on approximate z location of deposited energy on cell-by-cell basis
- Reconstructed z location using preliminary timewalk corrections as presented last week, using TDC information when available
- No clustering
- Compare reconstructed value to truth value

Z resolution (150 MeV<E<250 MeV)



- Nominal z resolution (BCAL NIM paper): 1.1 cm/sqrt(E)
- Z resolution is too good in simulation!

Preliminary look at clustering

- Reconstruction (DBCALPoint) modified to use preliminary timewalk corrections (see last two talks)
- Clustering algorithm uses z information from precise TDC information, when available
- Two algorithms: KLOE and IU
- Neither algorithm appropriately handles the issue of having hits with different time resolution (some hits have only ADC info, some have TDC+ADC info)

Preliminary look at clustering

- Two striking issues:
  - IU algorithm produces a large number of spurious clusters (1.3 clusters/photon)
  - KLOE algorithm has much (~1.5x) worse z-resolution than IU algorithm
- Why?
  - Poor timing resolution on ADC-only hits can cause these to look “far” from other hits, IU algorithm is not aggressive enough in merging these hits
  - KLOE doesn't consider errors on times (times with larger errors should be given smaller weight when averaging quantities, if this is not done then the averages will be poor)

Prelimary look at clustering

- Moral: ADC timing information is important!
- Clustering algorithms must deal with this correctly

mcsmear issues

- fADC timing (doesn't match FPGA algorithm)
- TDC timing (too good)
- Spikiness in energy spectrum
- Spikes in time histogram at low energy
- Maximum ADC amplitude?