

BCAL Simulation

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Recompile to access new mechanism

Two files must be modified and recompiled to enable the new mechanism.

In HDGeant, edit file hitBCal.cc

```
74 #include "calibb.h"
75 }
76
77 #include <DHistogram.h>
78
79 // Use the following to switch on and off the single hit
80 // and full spectra methods of writing out the BCAL info.
81 #define WRITE_OUT_BCAL_CELL_HITS 0
82 #define WRITE_OUT_BCAL_TIME_SPECTRA 1
83
84
85 extern float BGGATE1;
```

In mcsmeas, edit file smear_bcal.cc

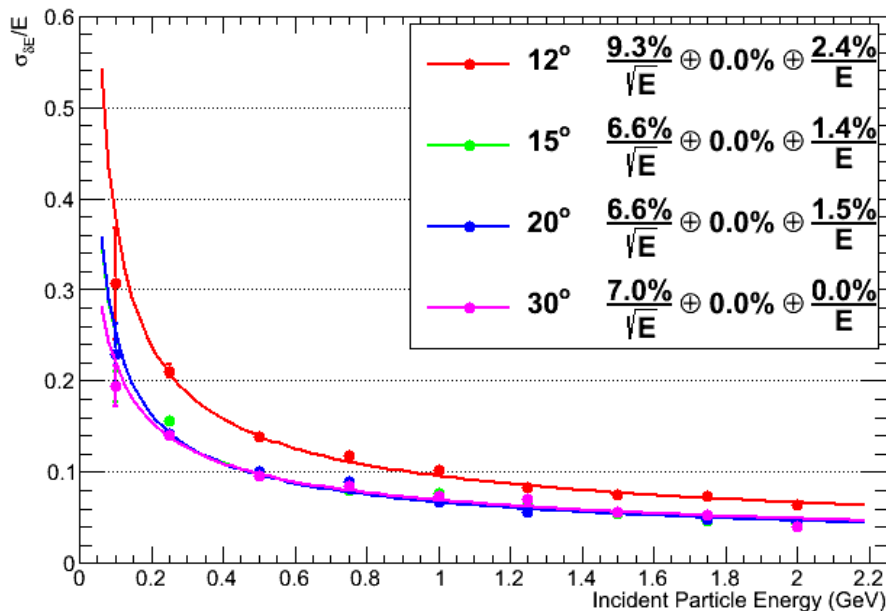
```
1 // $Id: smear.cc 7650 2011-03-29 22:52:30Z shepherd $
2 //
3 // Created June 22, 2005 David Lawrence
4 //
5 // Major revision March 6, 2012 David Lawrence
6
7 // Set the following to 1 to use the new timing spectrum scheme and 0 to use old scheme
8
9 #if 1|
10
11 #include <iostream>
12 #include <iomanip>
13 #include <vector>
14 #include <map>
15 #include <sstream>
```

Separate TDC and ADC hits

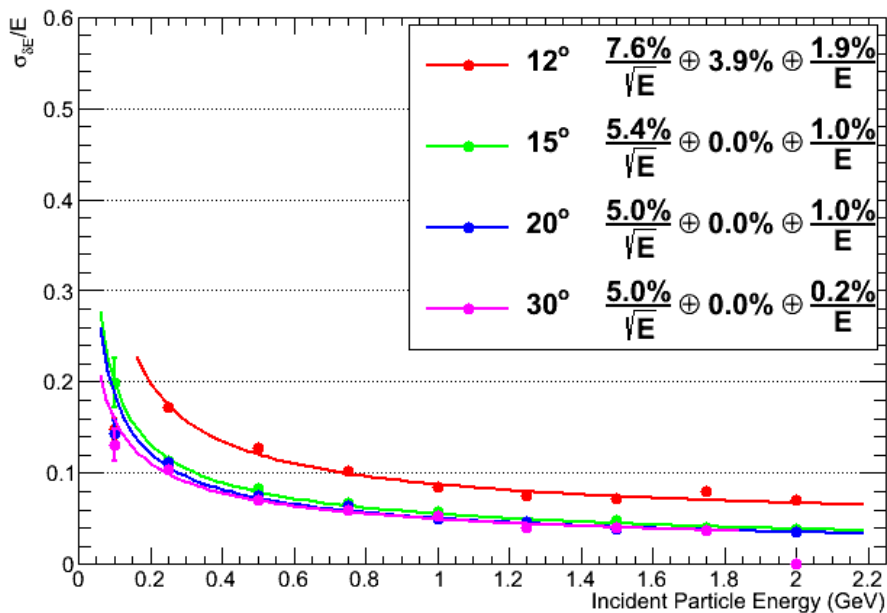
- Extended HDDM to allow TDC hit information to be kept separately
 - Threshold for TDC now separate from that for ADC
 - TDC: 45mV ADC:4mV
- DBCALHit holds ADC info
 - fADC counts for energy
 - Leading-edge timing, smeared with Gaussian of 4ns
- DBCALTDCHit holds TDC info
 - Leading-edge timing with intrinsic resolution due to 100ps binning

Energy Resolution

With dark hits and 4mV threshold



- $\sim 0.9 \text{ mV/MeV}$ for ADC leg
- Fits appear good by eye when floor term fixed at 1.3%

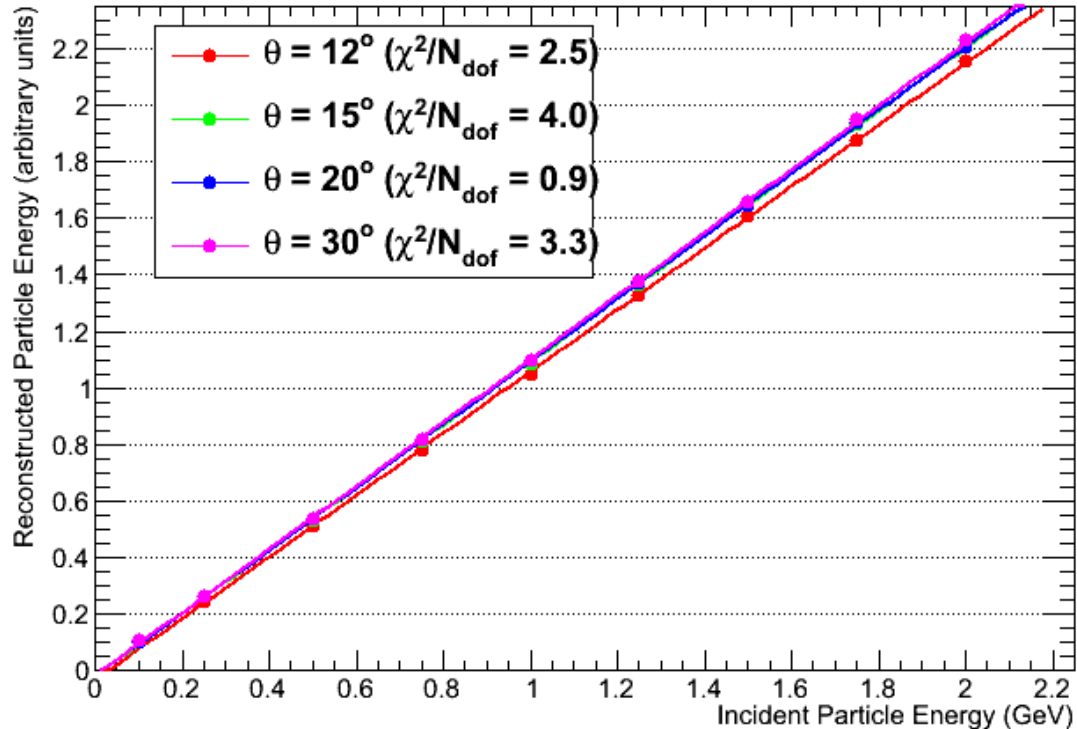


Without dark hits and 0.001mV threshold

Energy Calibration

BCAL Energy Calibration

September 4, 2012 DL
svn revision 9396



- Reconstructed showers appear to be linear w.r.t. generated energy

- Mono-energetic photons simulated and means of reconstructed energy plotted here vs. thrown energy
- A rough calibration parameter was added to the DBCALPoint constructor to get units close to GeV
- The DBCALPoint_factory has cut on energy of hit from DBCALHit (100keV). *THIS NEEDS TO BE FIXED*