

New Scintillator variants

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Overview

- Evaluate the performance of a scintillator AHCAL variant
 - square tiles, 0.5, 1, 2, 3, 4, 5 cm side length
- Evaluate performance of a “generic DHCAL”
 - using scintillator tiles with a threshold
- Using DESY AHCAL prototype dimensions
 - only varying tile size

<http://agenda.linearcollider.org/event/6389/session/5/contribution/78/material/slides/0.pdf>

HCAL Barrel Comparison

Before:

```
<slice material = "Steel235" thickness = "1.89*cm" />  
<slice material = "Polystyrene" thickness = "0.66*cm"  
sensitive="yes" limits="cal_limits" />  
<slice material = "G10" thickness = "0.1*cm" />  
<slice material = "Air" thickness = "0.15*cm" />
```

After:

```
<slice material = "Steel235" thickness = "1.89*cm" />  
<slice material = "Polystyrene" thickness = "0.3*cm"  
sensitive="yes" limits="cal_limits" />  
<slice material = "G10" thickness = "0.09*cm" />  
<slice material = "Air" thickness = "0.52*cm" />
```

Step length

Before:

```
<limits>  
<limitset name="cal_limits">  
<limit name="step_length_max" particles="*" value="5.0"  
unit="mm" />  
</limitset></limits>
```

After:

```
<limits>  
<limitset name="cal_limits">  
<limit name="step_length_max" particles="*" value="2.5"  
unit="mm" />  
</limitset></limits>
```

Status and Plans

Currently generating Single Particles for calibration.

Still to do:

- Calibrate new detectors → end of next week
- Implement noise in digitization (Scintillator significantly more noisy than RPC) → beginning of December
- choose one of the variants as “digital” model and implement appropriate threshold
 - Study and tune PandoraPFA performance

By January Workshop:

Can have detector variants and (maybe) some idea of PandoraPFA. No time for physics studies.