Subject: Possible improvement to dE statistics in DSSSDs?
Posted by LScruton on Tue, 30 Sep 2014 13:03:57 GMT
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Hi,

I was having a look at the statistics of the LYCCA wall DSSSDs at various points through the code from raw to fully calibrated and noticed that there was quite a drop in stats caused by the following if statement in DSSSD.cpp:

```
if( n_clusters_p != 1 || n_clusters_n != 1)
  return;
```

where n_clusters_p and n_clusters_n are the number of "groups of hits" in an event... i.e, if p-side strip 5,6 and 7 were hit in an event, the cluster multiplicity would be 1, whereas if p-side strips 5,6,7 and 12 were hit in an event, the cluster multiplicity would be 2.
I guess this is there so that only events with one group of neighbouring hits are allowed to continue in the analysis to make the sub-pixel algorithm easier to calculate, which makes sense. However, this also means that events where there is one low-energy spurious hit found away from a group of real hits of neighbouring strips
are ignored.

Is there any other reason why this if statement was included other than making the sub-pixel algorithm easier?

I tried getting rid of this if statement and including a bit more code that limited the sub-pixel algorithm to only those strips around the strip with the maximum energy. Comparing the two methods, I found an increase of ~8% in stats for the wall DSSSD and ~60% increase in target DSSSD stats when plotting the x-y maps. There is also around 7-8% increase in statistics in the Coulex isotope in the LYCCA dE-E plot.

I've attached the DSSSD.cpp file with the changes mentioned... I hope this turns out to be useful, although I wanted to double check that this doesn't introduce any issues with the rest of the code!

What do people think?

File Attachments

1) DSSSD.cpp, downloaded 606 times
2) DSSSD.hpp, downloaded 619 times