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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?

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### File Attachments

- 1) [DSSSD.cpp](#), downloaded 540 times
  - 2) [DSSSD.hpp](#), downloaded 545 times
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