Subject: Digitization Discussions
Posted by Ralf Kliemt on Fri, 25 Jul 2008 09:58:05 GMT
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Hello everyone,

Since there are now more than two people working on the MVD code I'd move the communications from skype back to the forums.
The topic is set as sticky so it will not disappear if there arise other temporary topics.

The following list contains digitization issues which I am aware of:

Noise production & fake hits (electronics issue)
Charge cloud simulation/emulation (material issue)
Digi merging & removing for multiple hit channels (technical issue)

Feel free to share your thoughts.

Subject: Re: Digitization Discussions
Posted by Ralf Kliemt on Fri, 25 Jul 2008 10:53:20 GMT
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I'll start off with the noise producer:

The task pandaroot/mvd/MvdDigi/PndMvdNoiseProducer adds to the pixel and strip digi arrays some random noisy channels.

I take the noise to be gaussian distributed in charge aroud some mean value with a sigma (commonly called noise). Due to the calibration of the sensor channels the mean value is not important at all and only the difference to the threshold value is of interest.

The following picture shows the charge entries in pixel and strip cells for DPM at 6GeV/c with a noise of
Pixels: 200e threshold: 600e
Strips: 1000e threshold: 300e
These are the blue and green Bumps (gaussian tails) cut at 3 sigma.

I conclude from that that the threshold needs to be set at least to 1200e for the pixels and to 5000e for the strip part. The signal entries we cut off here have a low charge deposit in the sensors and are probably the edges of clusters. The main drawback here is to loose in spatial point resolution.

As told by Tobias the ATLAS pixels use a 10*sigma threshold.

Kind greetings from Dresden,
Ralf.

File Attachments

1) Screenshot.png, downloaded 1642 times