Subject: Re: Cut in energy for EMC hit and digi
Posted by Dima Melnychuk on Thu, 18 Dec 2014 10:06:30 GMT
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Hi Stefano,
I suppose that EnergyHitThreshold could be safely changed to the same value as EnergyDigiThreshold and indeed it can reduce data size but probably not so much.

The reason for two separate cuts is historical.
Initially where only PndEmcHitProducer was implemented the EnergyHitThreshold cut played the role of the threshold set for EMC electronics. But later when digitization classes were implemented this electronic threshold was moved to digi classes but separate parameter was introduced EnergyDigiThreshold.

So the low value of EnergyHitThreshold is effectively 0 and from PndEmcHit you can study the distribution of energy deposited in crystals even for low energy close or below the threshold and changing one parameter EnergyDigiThreshold you can see how energy resolution is affected by this threshold.
And the role of EnergyHitThreshold could be only the data size reduction. And if you want to reduce the data size by default you can increase it as high as EnergyDigiThreshold.

Concerning the value of the threshold it should be indeed at the level of 3 sigma of electronics noise for the whole calorimeter, which will give 1 per 1000 EmcDigi from electronics noise. But so far with prototype measurements where the number of crystals is lower the threshold was not set at 3 sigma level but was optimized by hand and digitization parameters in simulation are based more or less on prototype measurements. So I would leave in simulation it as it is now and at the end it will be modified according to values used in real Panda experiment.

Dima