Subject: Re: EMC resolution

Posted by Dima Melnychuk on Wed, 30 Oct 2013 14:23:31 GMT

View Forum Message <> Reply to Message

Some additional results on emc resolution from my side.

First of all after Jifeng put a latest version of digitization by default, (based on code for EMC feature extraction developed at KVI) the energy resolution is different.

I did study for barrel 30-130 degree range, 10 k events, 1 GeV photons.

For new digitization sigma=1.6%

For previous digitization sigma=1.2%

There are two options for non-uniformity, first is based on measurements and implemented by Christian Hammann, sigma=2.6%

And second one (linear non-uniformity) is based on fit to reproduce prototype data and implemented by Hossein Moeini, sigma=2.5%, so both options are very close.

You can use this option with

PndEmcHitProducer\* emcHitProd = new PndEmcHitProducer(); TString nonuniformityFile=gSystem->Getenv("VMCWORKDIR"); nonuniformityFile+="/macro/params/EmcDigiNoniformityPars2.root"; emcHitProd->SetNonuniformityFile(nonuniformityFile.Data());

So non-uniformity definitely affect the result as well as newer digitization.

But you can see if you use non-uniform response the peak position is shifted and calibrartion/energy correction is necessary. And shift is in different direction for two implementations of non-uniformity. Hossein provided correction for his case but it was for older digitization and newer digitization shift a peak position itself a little bit. So it should be redone.

So I plan to redo energy correction for new digitization with both non-uniformity options and I hope rather soon.

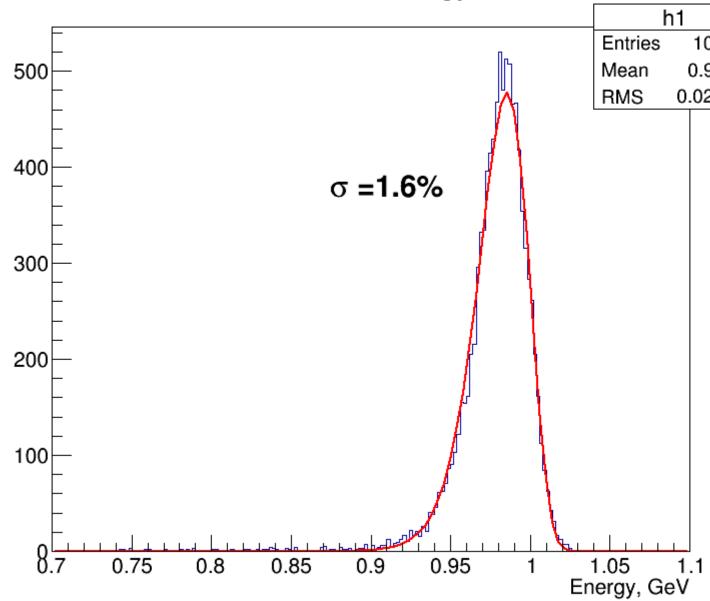
2.6% resolution for 1 GeV photon is what Christian Hammann quoted before as a result in agreement with prototype data.

So when energy correction will be ready the question can be closed.

Dima

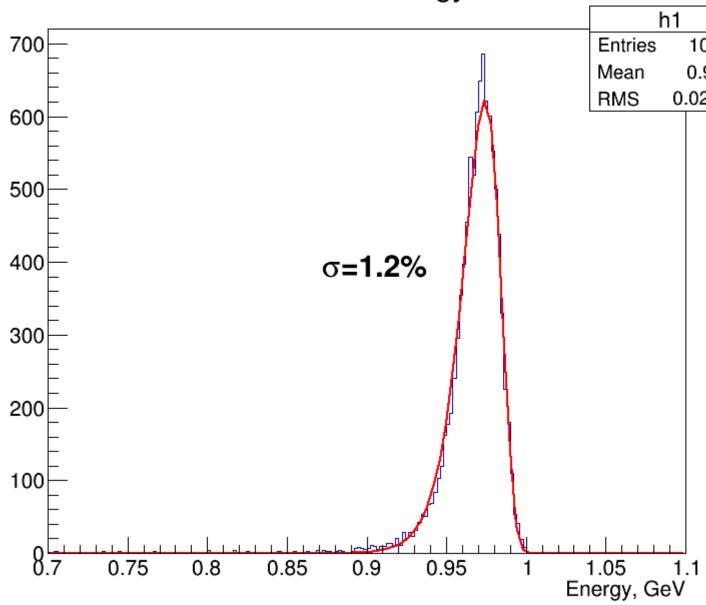
File Attachments
1) energy1.png, downloaded 1126 times

## Cluster energy



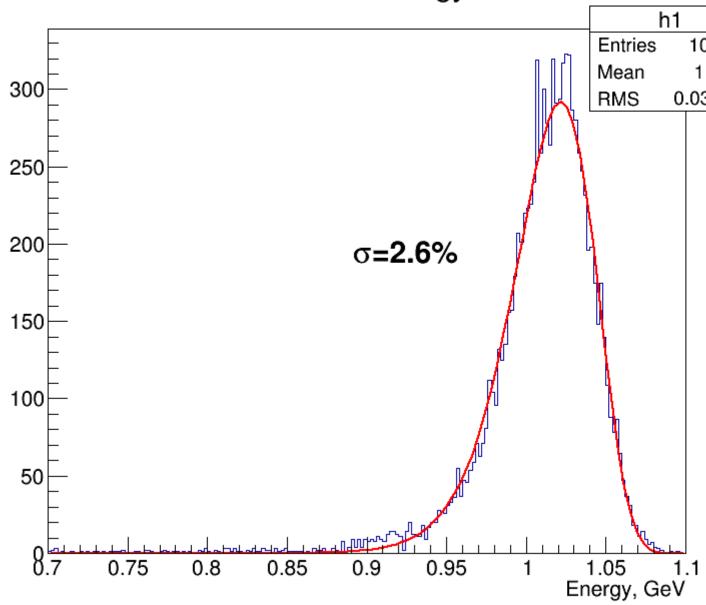
2) energy2.png, downloaded 1071 times

## Cluster energy



3) energy3.png, downloaded 1016 times

## Cluster energy



4) energy4.png, downloaded 1182 times

## Cluster energy

