Subject: Re: EMC resolution
Posted by Dima Melnychuk on Wed, 06 Nov 2013 11:35:29 GMT
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Hi,

I have just update emc energy correction parameters for the case of non-uniformity switched on with the latest version of digitization.

I also switched on the use of non-uniformity by default in all.par

The files with correction are in /macro/params/
emc_correction_hist_gamma_2.root
emc_correction_hist_gamma_3.root
emc_correction_hist_gamma_4.root
emc_correction_par_gamma_2.root
emc_correction_par_gamma_3.root
emc_correction_par_gamma_4.root

You use correction like

PndEmcAbsClusterCalibrator * calibrator1=
PndEmcClusterCalibrator::MakeEmcClusterCalibrator(1, 3);

And then obtain calibrated energy like
cluster_energy_calibrated=calibrator1->Energy(cluster);

And here first number stands for the method applied (1 - correction from histogram, 2 - correction from parametrization)

Second number stands for version and here
1 - previous version of digitization, no non-uniformity (deprecated)
2 - current version of digitization, no non-uniformity
3 - current version of digitization, with non-uniformity
(should be used by default)
4 - current version of digitization, with non-uniformity calculated by Hossein (linear non-uniformity 1.5%, set from the file /macro/params/EmcDigiNoniformityPars2.root)

By the way the macro which produces the last non-uniformity file is
/macro/emc/dedicated/fill_nonuniformity_param.C

Here some plots which demonstrate how applying non-uniformity change reconstructed emc energy. I do not know if it's by accident or by intention of Christian Hammann who provided non-uniformity parameters from measured data in case of barrel EMC correction is almost not needed, i.e. 1 GeV energy peak is centred around 1 GeV. But for endcaps correction is still needed anyway.

For energies in range 0-10 GeV energy versus polar angle

Reconstructed energy of 1 GeV photons

Reconstructed pi0 invariant mass

In this last case the corrected energy gives even slightly worse results.

In PndPidCorrelator.cxx
fEmcCalibrator= PndEmcClusterCalibrator::MakeEmcClusterCalibrator(2, 1);

should be modified to

fEmcCalibrator= PndEmcClusterCalibrator::MakeEmcClusterCalibrator(2, 3);

Dima

File Attachments

1) e_vs_theta.png, downloaded 413 times
2) energy_1GeV.png, downloaded 373 times
3) mpi0.png, downloaded 392 times