Subject: Another update of EMC digitizaton (VPT readout option)
Posted by Dima Melnychuk on Tue, 01 Jun 2010 12:53:04 GMT
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Dear all,

I have committed another update to EMC digitization.
Till now in digitization code it was assumed that all the calorimeter have an APD readout. So now I have included VPT readout for the forward endcap.

I have modified slightly parameter file emc.par (and all.par). The following parameters describe APD and VPT options:

DetectedPhotonsPerMeV:Double_t 500
SensitiveAreaAPD:Double_t 200
SensitiveAreaVPT:Double_t 200
QuantumEfficiencyAPD:Double_t 0.7
QuantumEfficiencyVPT:Double_t 0.22
ExcessNoiseFactorAPD:Double_t 1.38
ExcessNoiseFactorVPT:Double_t 2.2
Incoherent_elec_noise_width_GeV_APD:Double_t 1.0e-3
Incoherent_elec_noise_width_GeV_VPT:Double_t 1.0e-3

Here DetectedPhotonsPerMeV is value measured by PMT readout at -25 deg. 90 p.e. divided by th QE of PMT (18%), which gives 500 photons. SensitiveAreaAPD is 2*7*14=196 mm^2 corresponds to readout by two rectangular APDs. SensitiveAreaVPT=200 corresponds to diameter of sensitive area of VPT 16 mm.

Electronic noise by default is equal 1 MeV for both cases, which are roughly the values given in EMC TDR. I case of VPT with Basel preamplifier it depends on parameters of external shaper, but roughly around this value.

These parameters are used in full digitization and also in simplified digitization which have smearing option.

And small remark concerning shashlyk case. Till realistic digitization for shashlyk is provided in full digitization the same parameters as for barrel are used. In simplified digitization smearing with experimental values is used and parameters are hardcoded at the moment.

Best regards,

Dima