Simulation Progress on Crystal Based, Fast Timing ECAL Design

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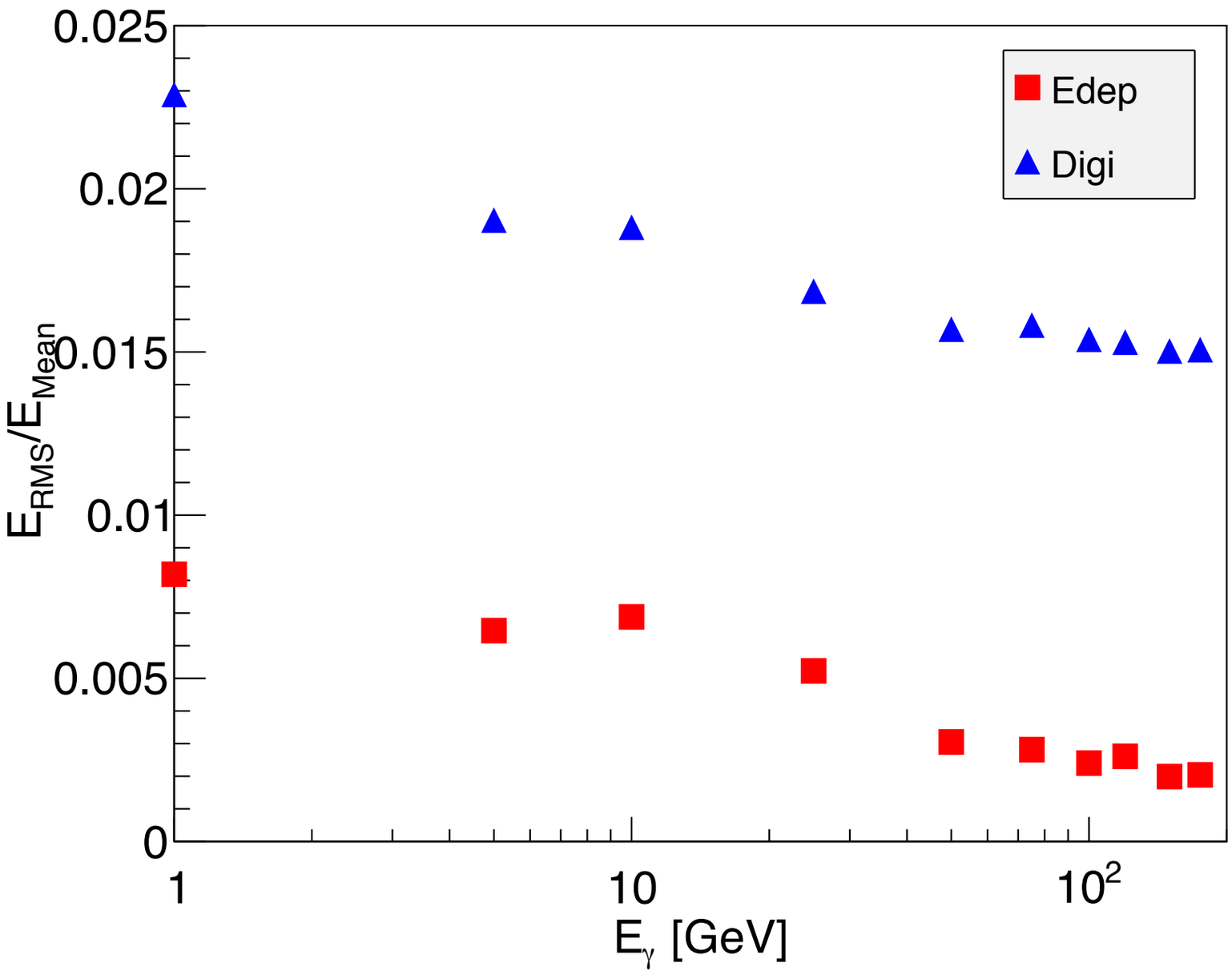
Photon Energy Resolution

Simplified Digitization

```
nPhoton = gRandom -> PoissonD( Edep*PhotonYeild );
nPhotonSmear = gRandom -> Gaus( nPhoton*PhotonColEff, resolution*nPhoton*PhotonColEff );
```



120GeV ~ 1.5%

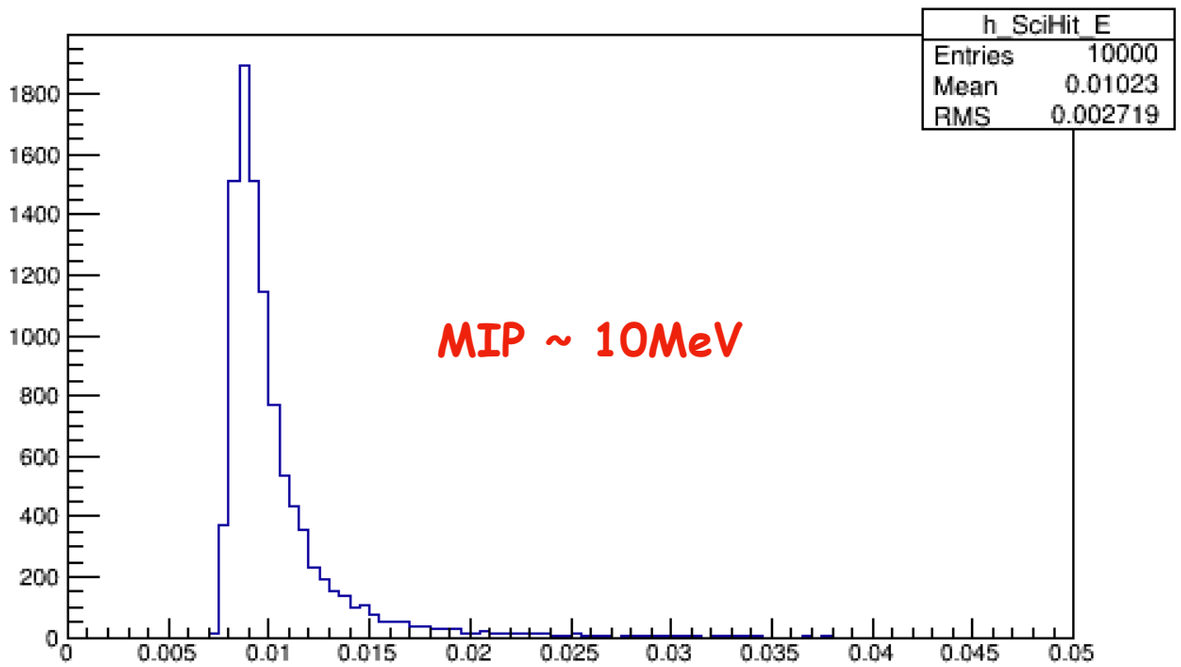
← PhotonColEff = 10%

resolution = 10%

Single Crystal

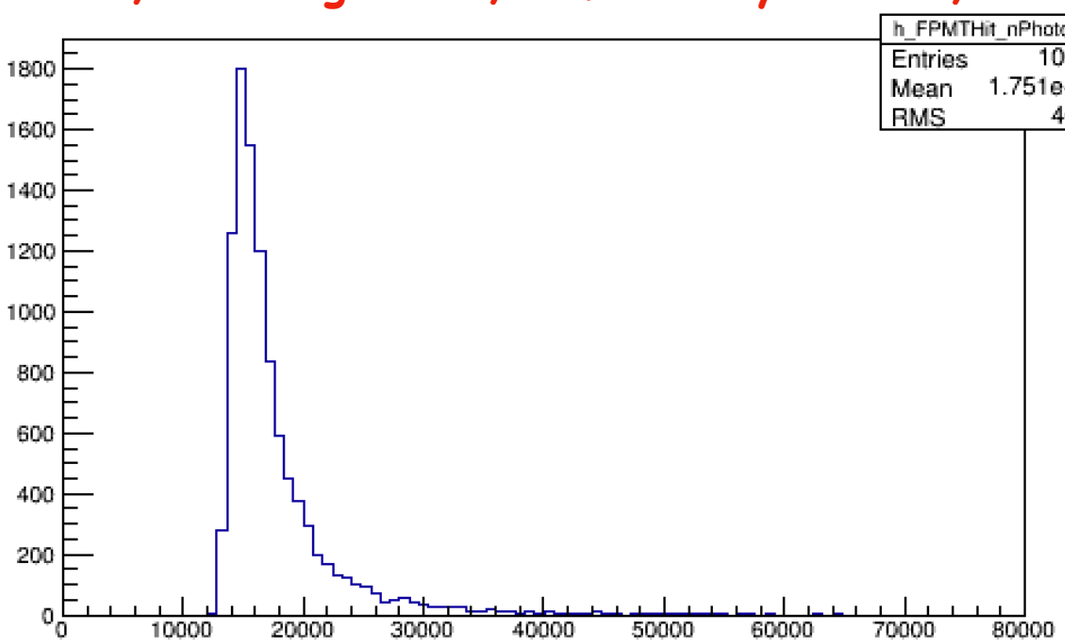
10GeV muon -> BGO: 1x1x40cm^3

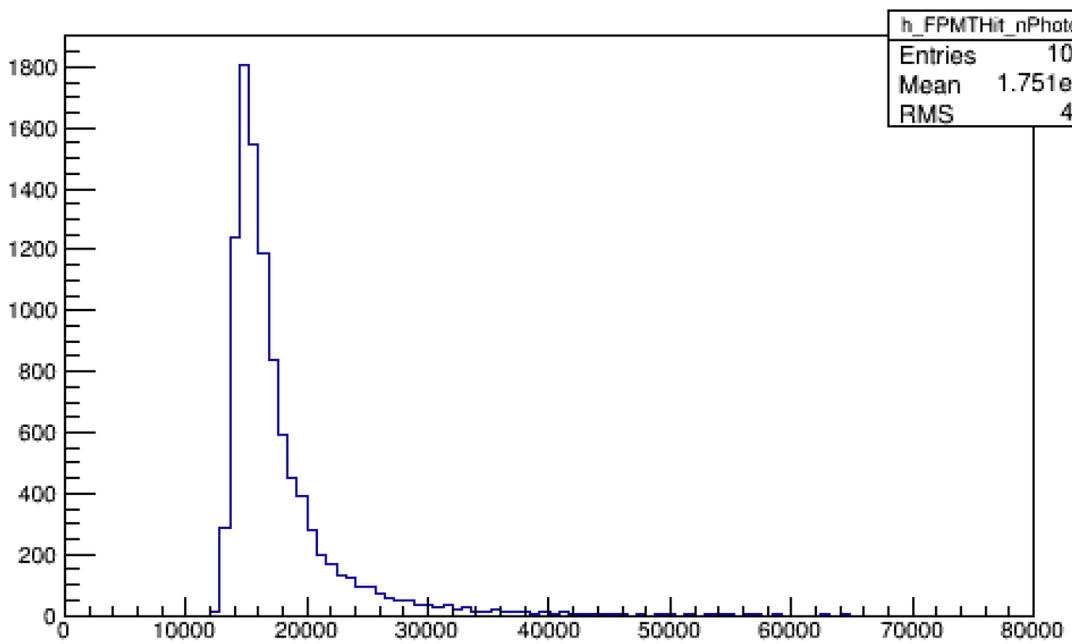
Energy spectrum



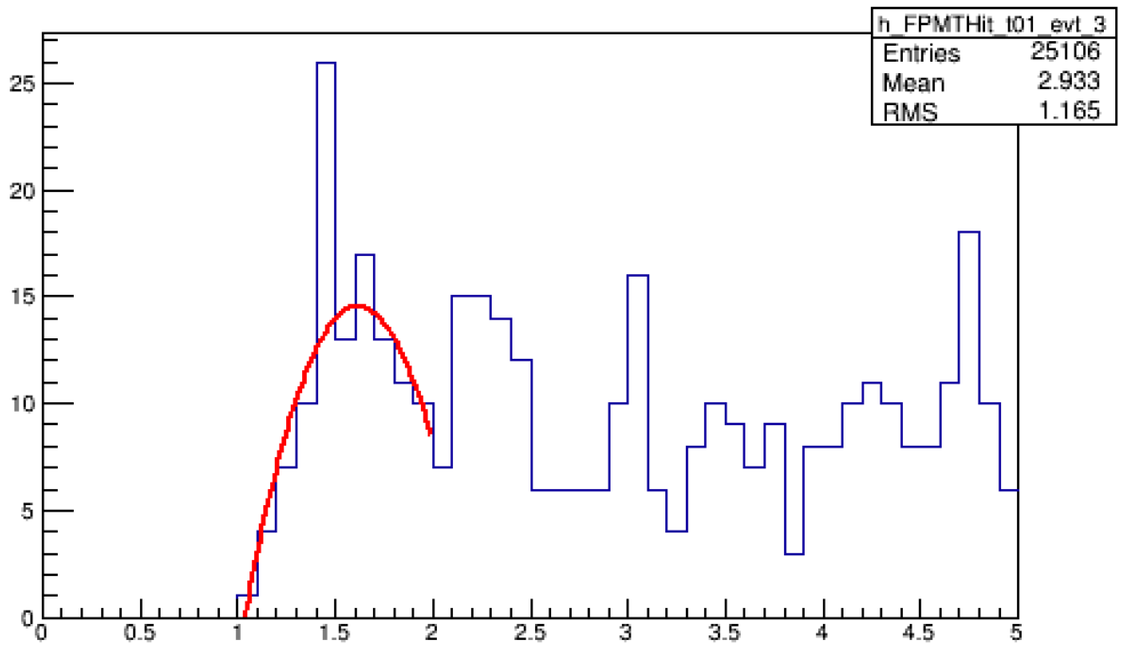
Distribution of nPhoton

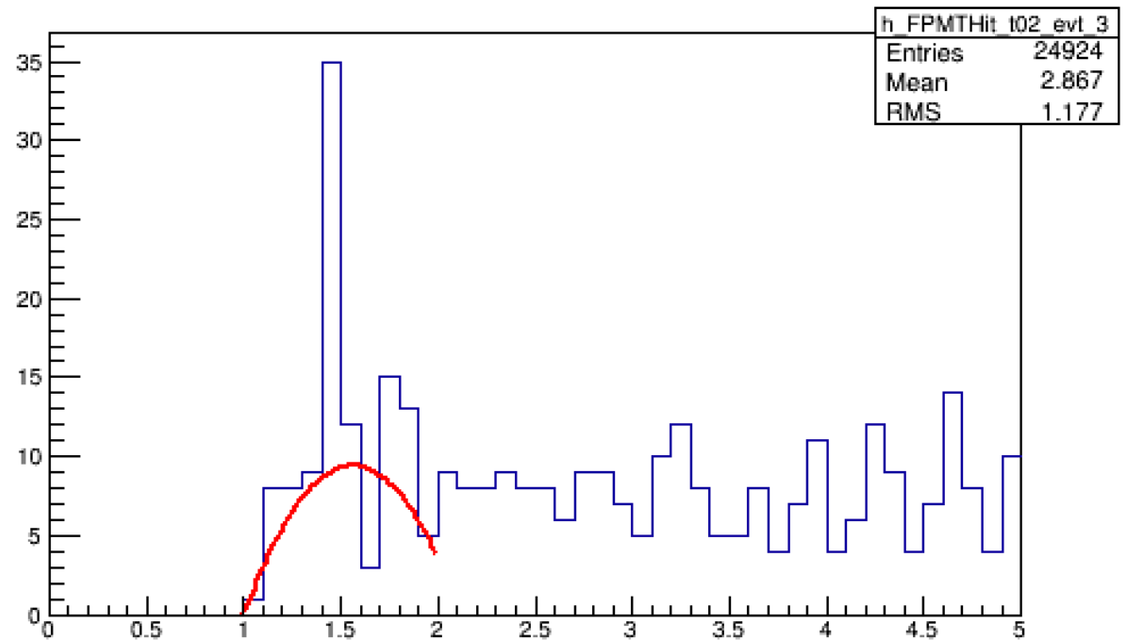
z = 0, AbsLength=7m, Reflectivity = 1.00, ColEff=100%

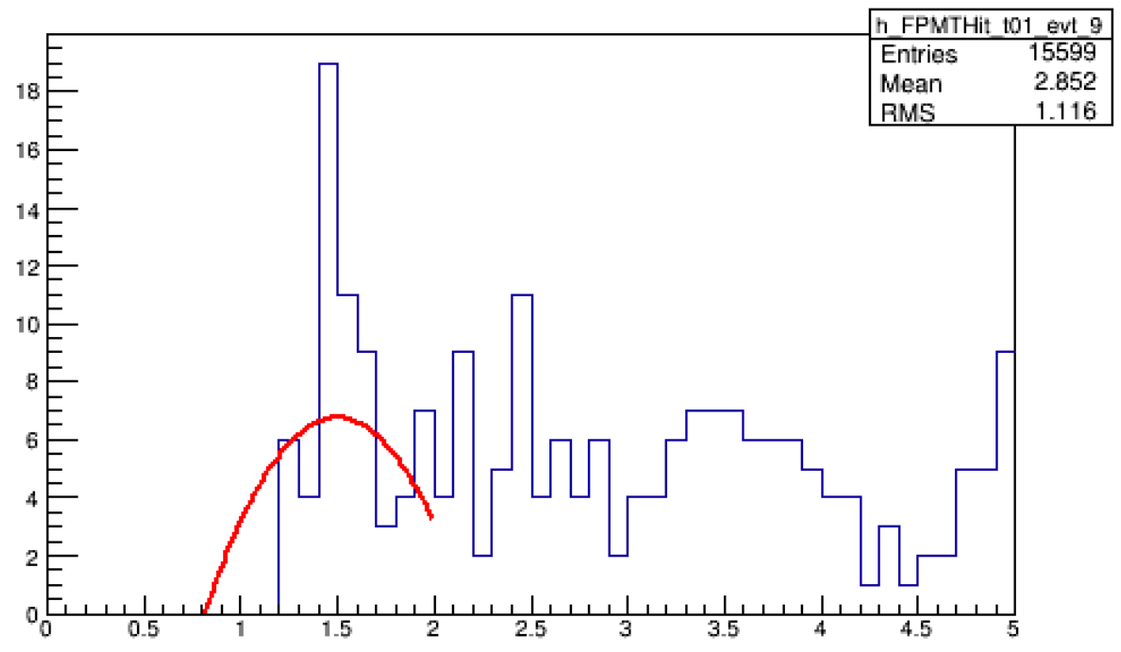


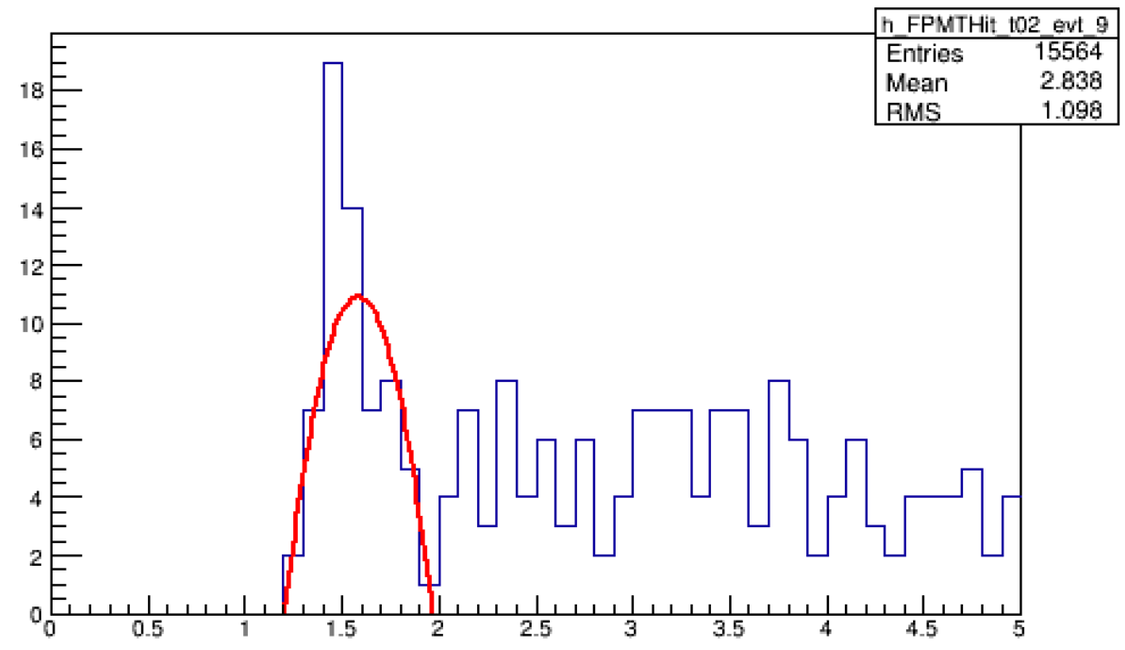


Photon time spectrum



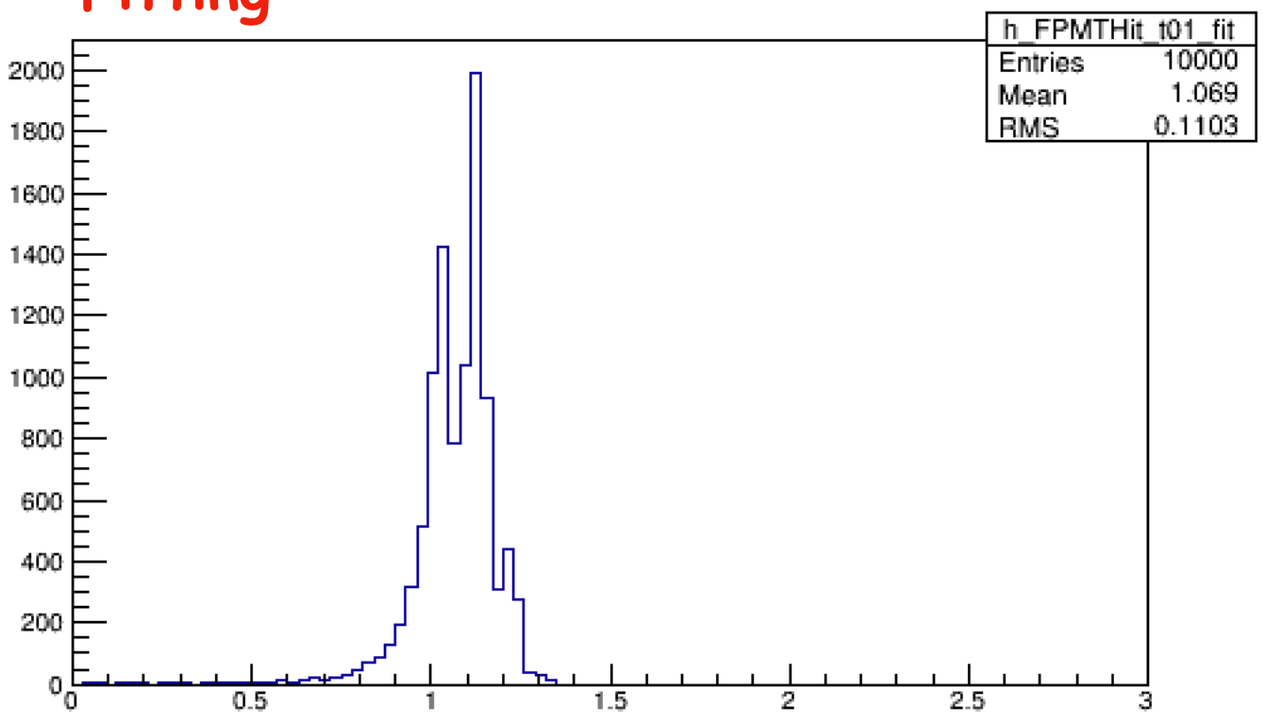


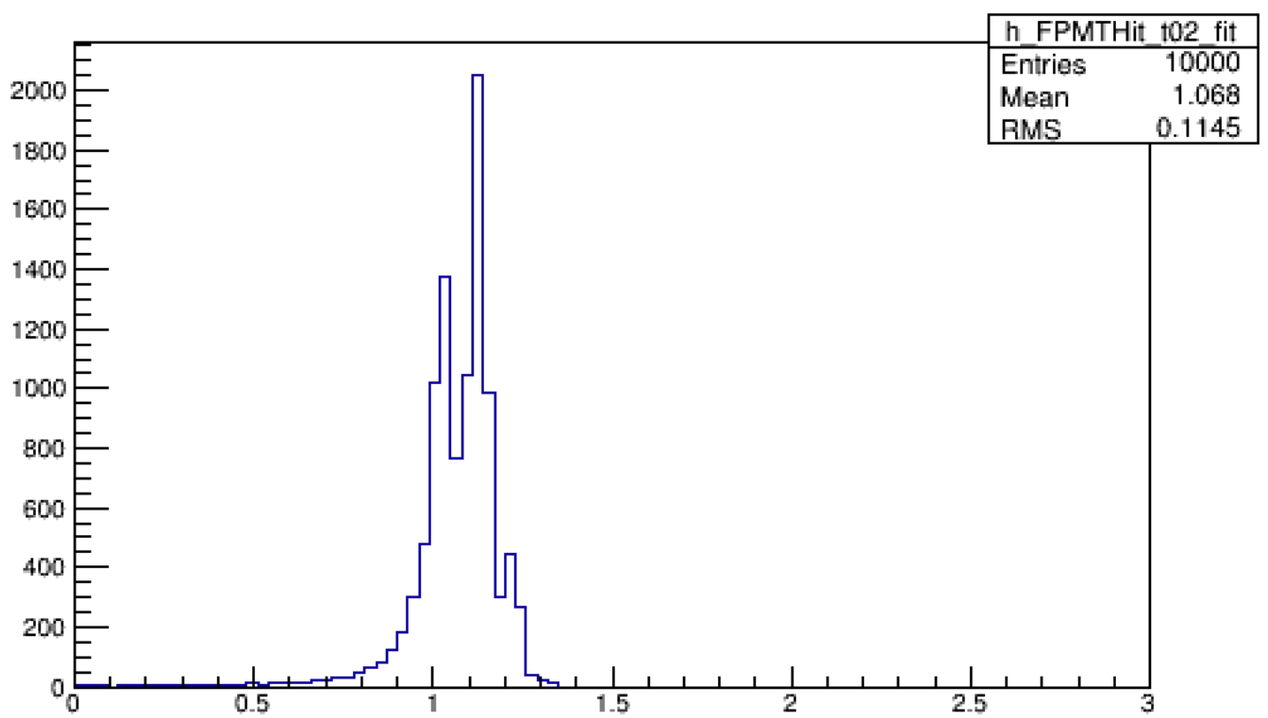




Two methods to measure time

Fitting





Time of fastest photon