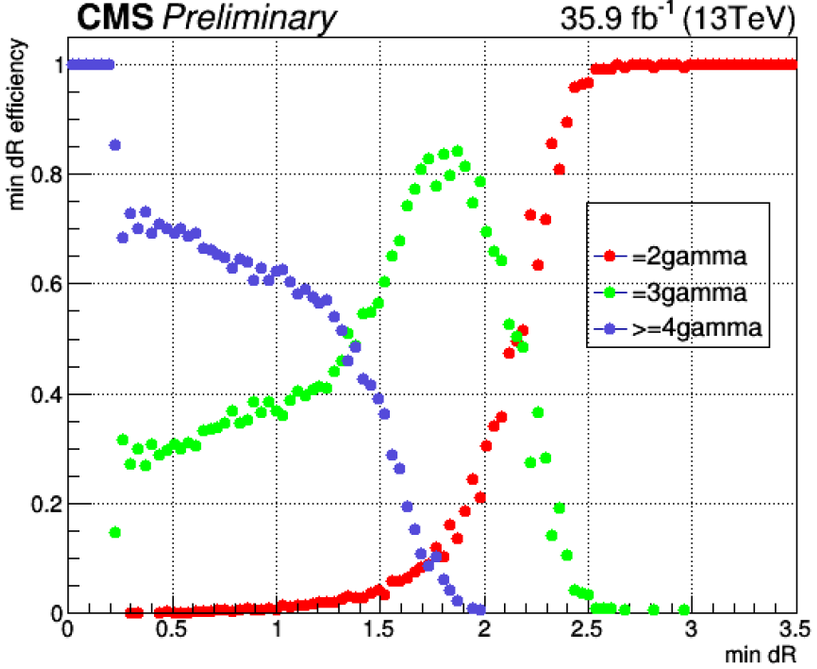
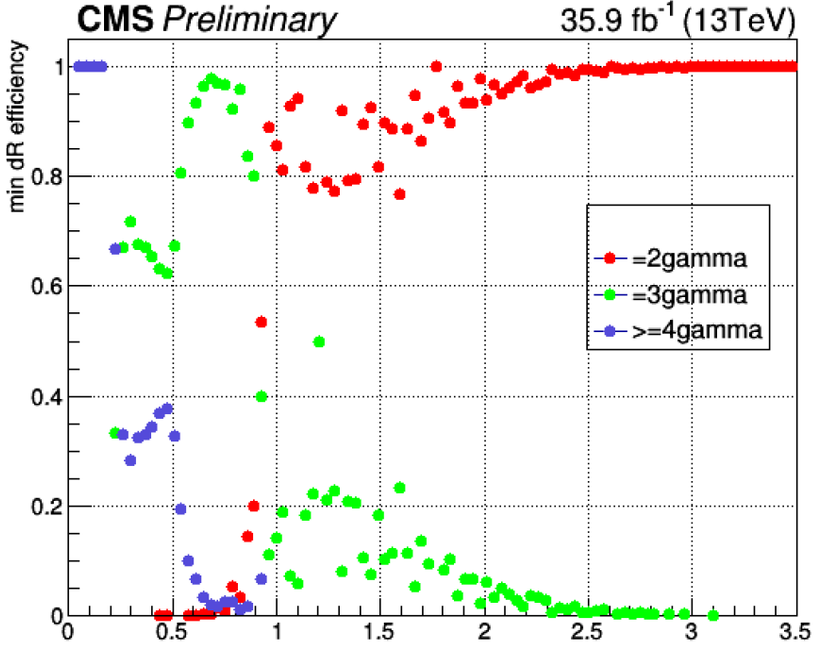
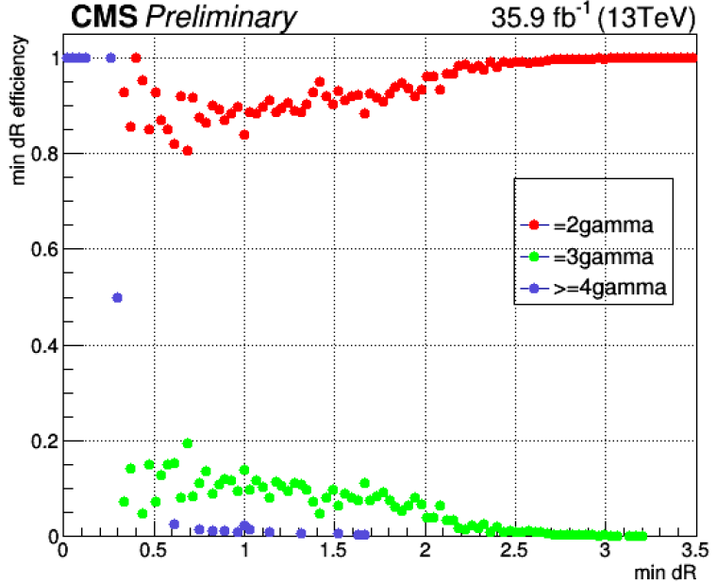
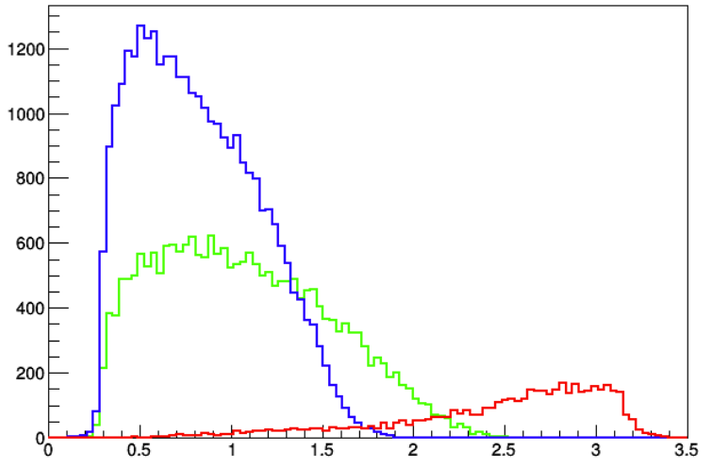
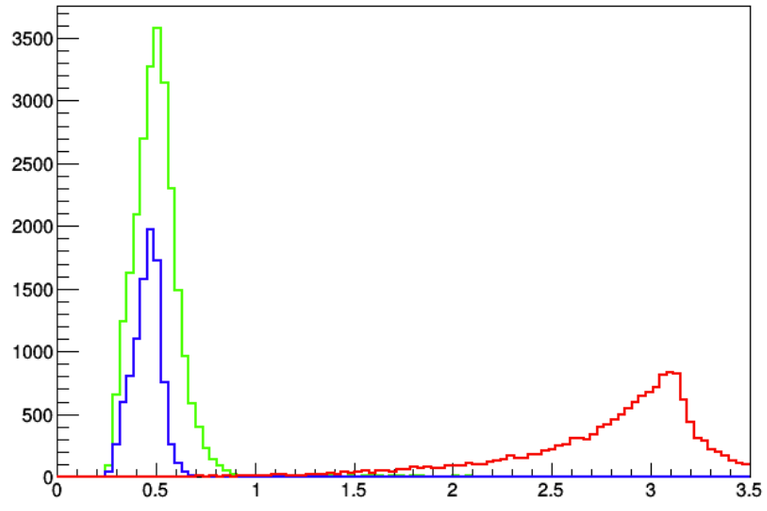




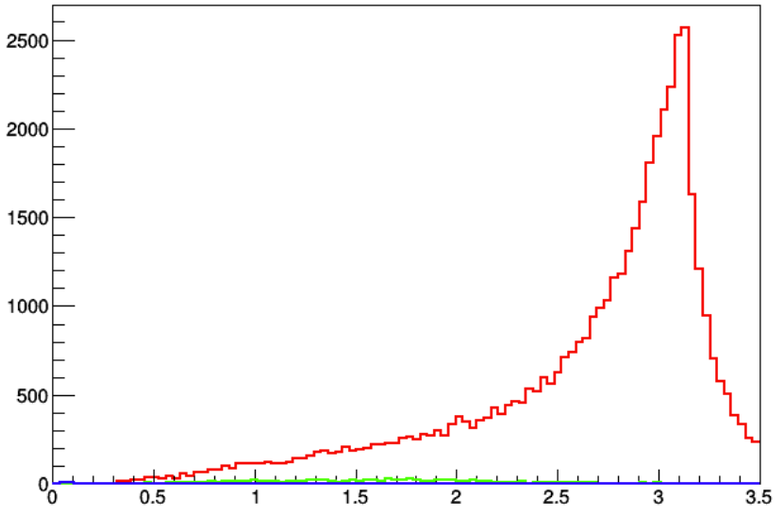




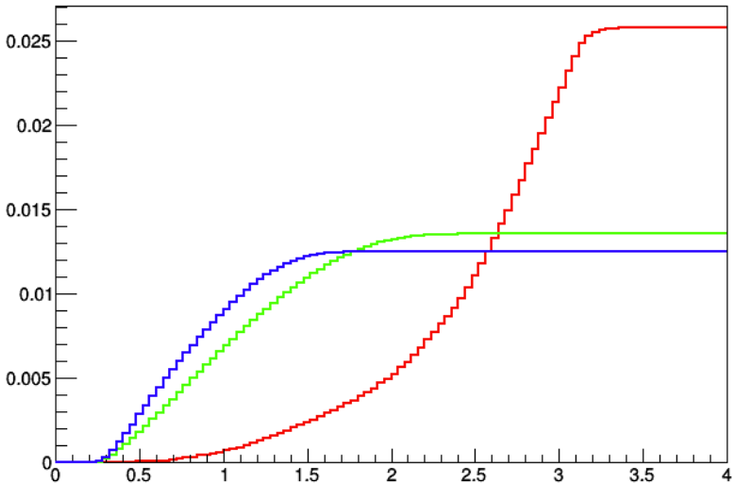
m(a)=60 GeV

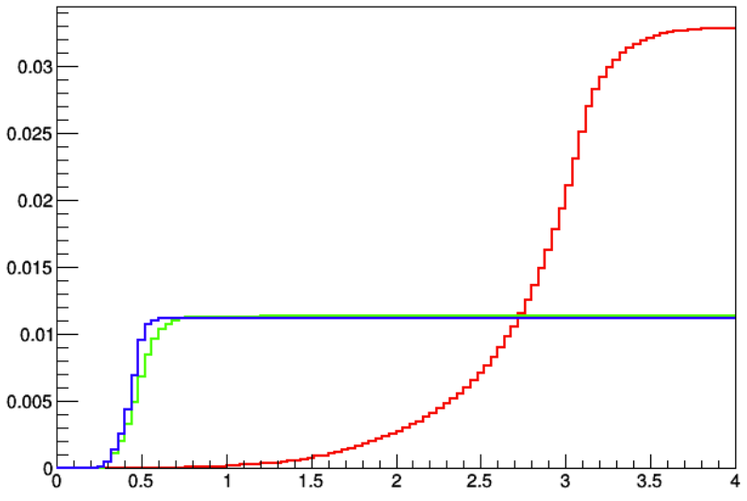


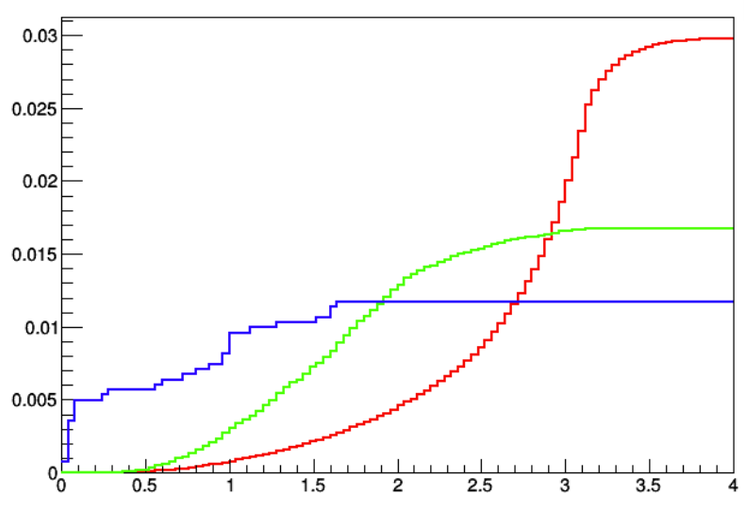
m(a)=15 GeV



m(a)=100 MeV

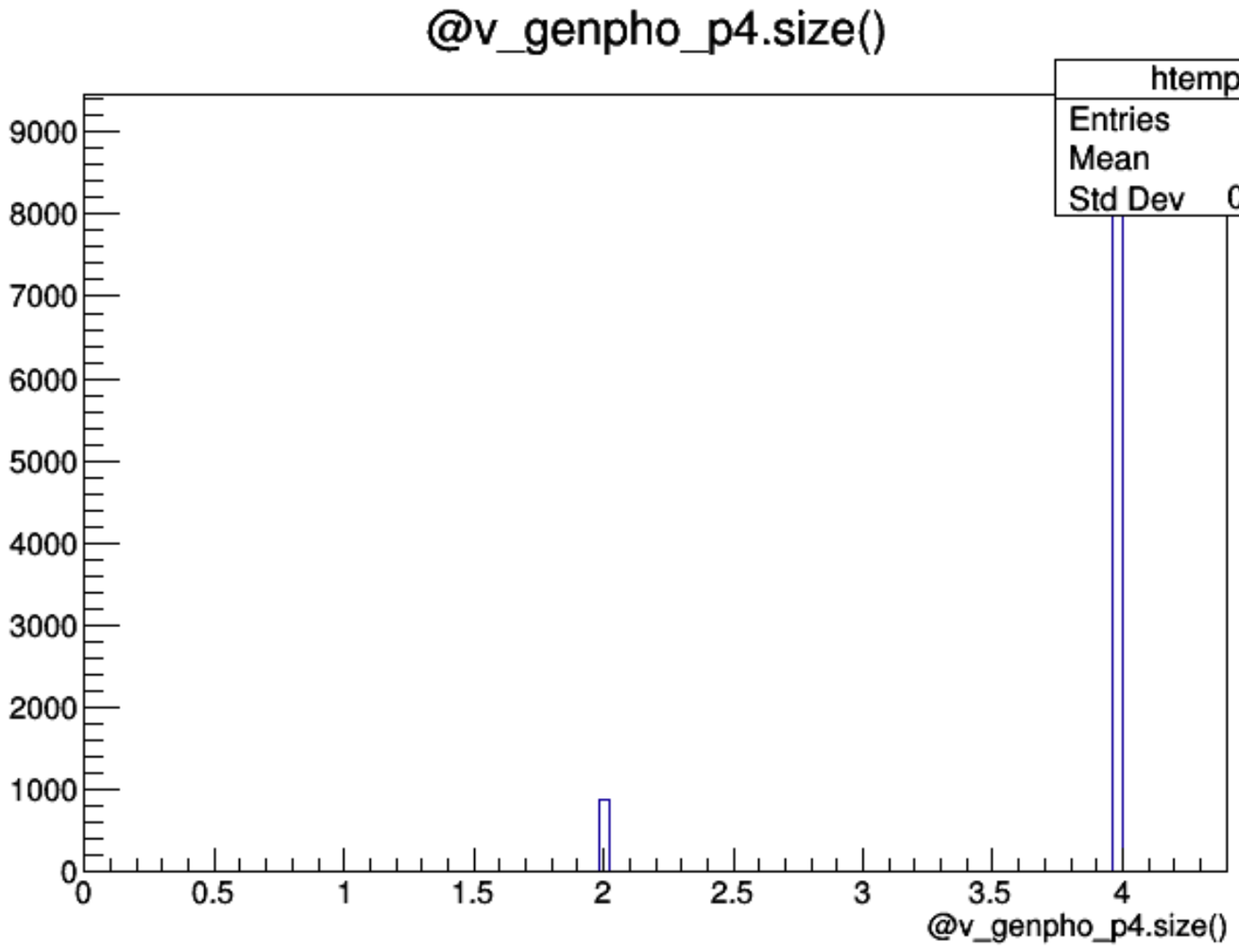






- Matching — identify events where all gen photons have been matched with reco photons
- The reco photons have pt> 15 GeV and |eta| < 2.5
- Logic :
  - Fill mylist1 every time you go over a gen photon https://github.com/NEUAnalyses/H4GFlash/blob/master/plugins/H4GFlash.cc#L1013
  - Fill mylist3 every time a match is found https://github.com/NEUAnalyses/H4GFlash/blob/master/plugins/H4GFlash.cc#L1022
  - When mylist1.size() == mylist3.size() (when all the gen photons are matched)
    - nicematch==1
    - Else nicematch==0
    - https://github.com/NEUAnalyses/H4GFlash/blob/master/plugins/H4GFlash.cc#L1072-#L1077

Number of gen photons



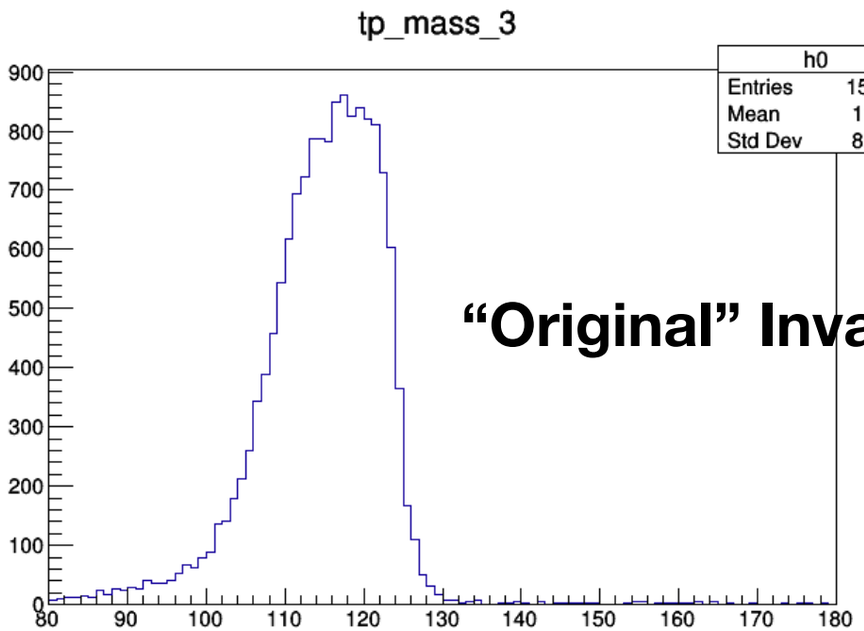
Events with:

0 gen photons = 14 (0.14%)

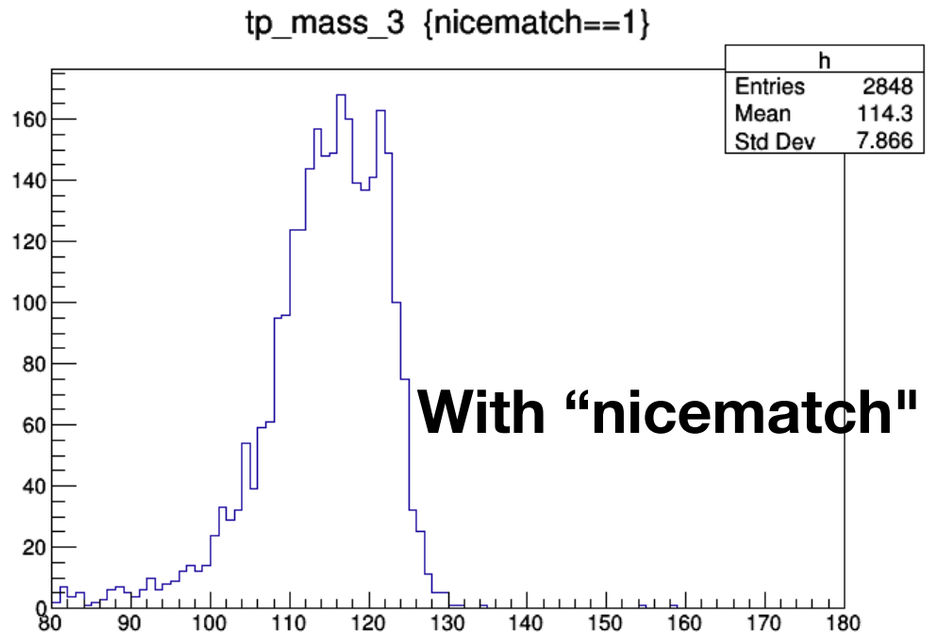
2 gen photons = 866 (8.75%)

4 gen photons = 9009 (91.11%)

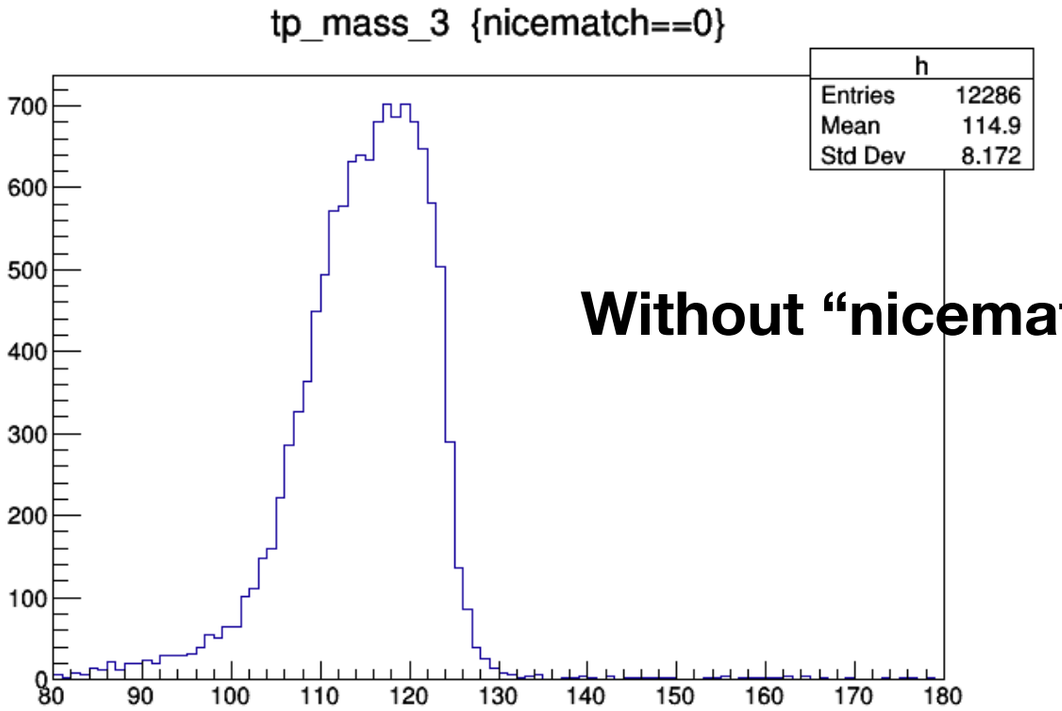
m(a) = 10 GeV



“Original” Invariant mass



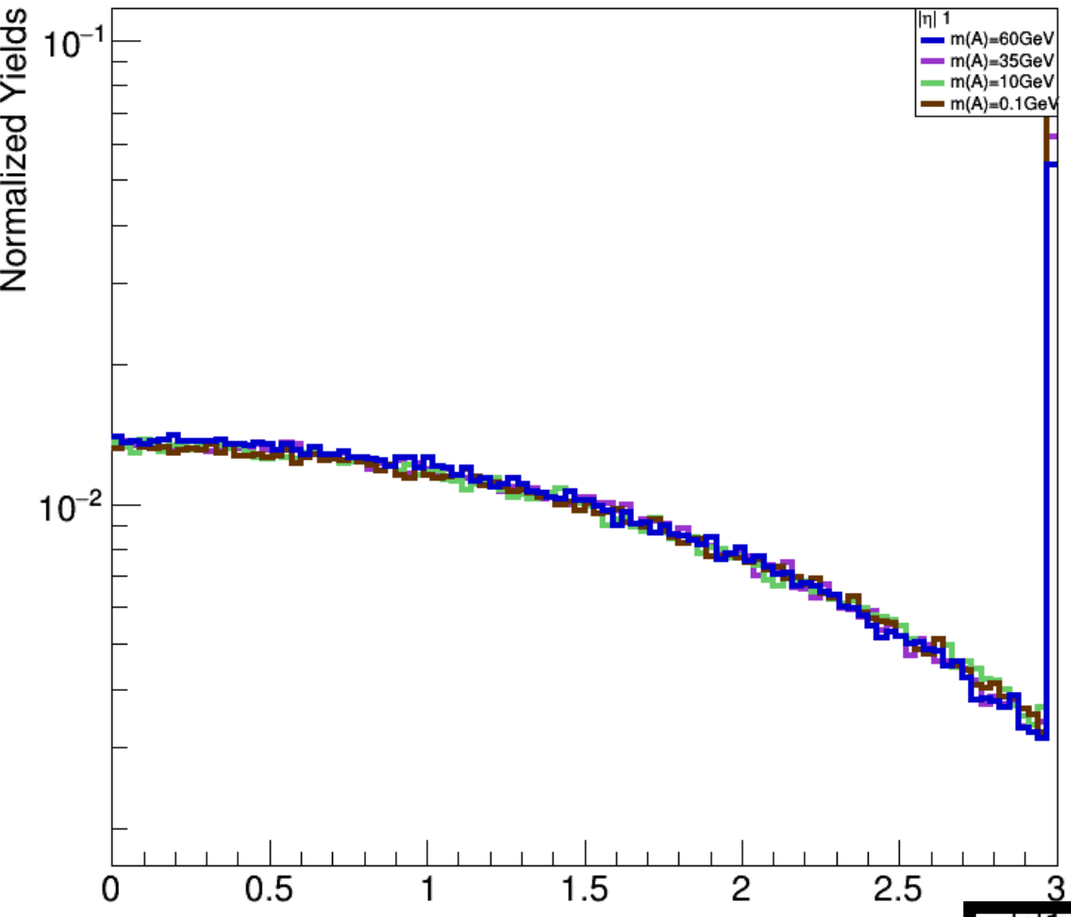
With “nicematch"

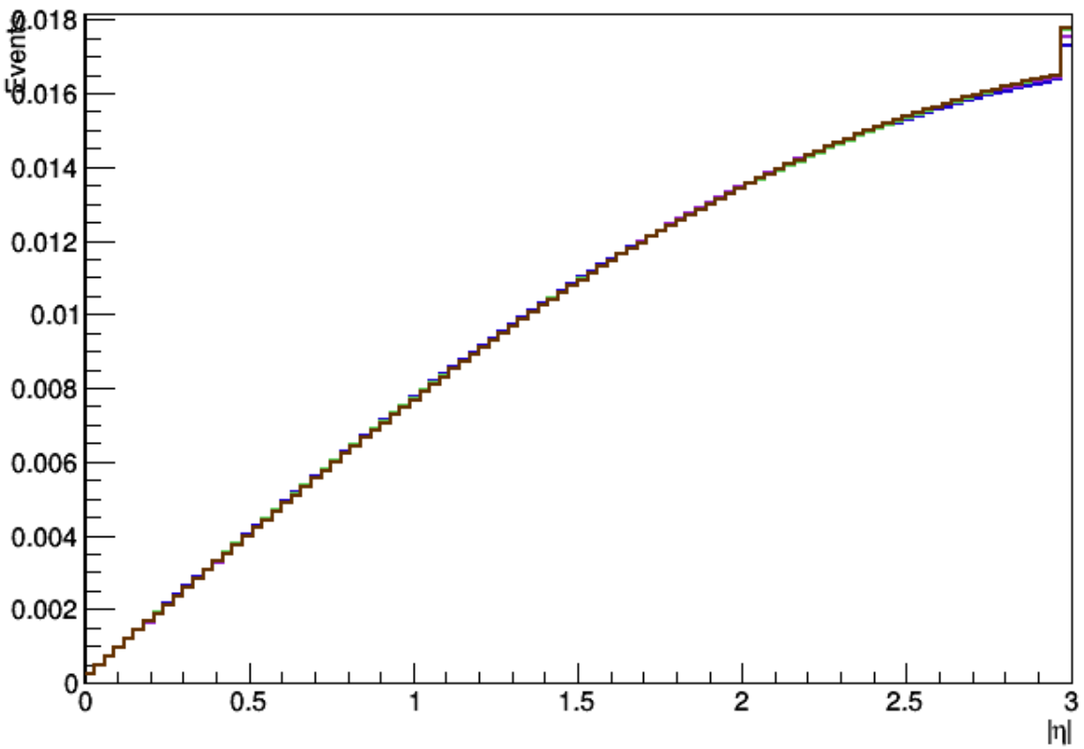


Without “nicematch"

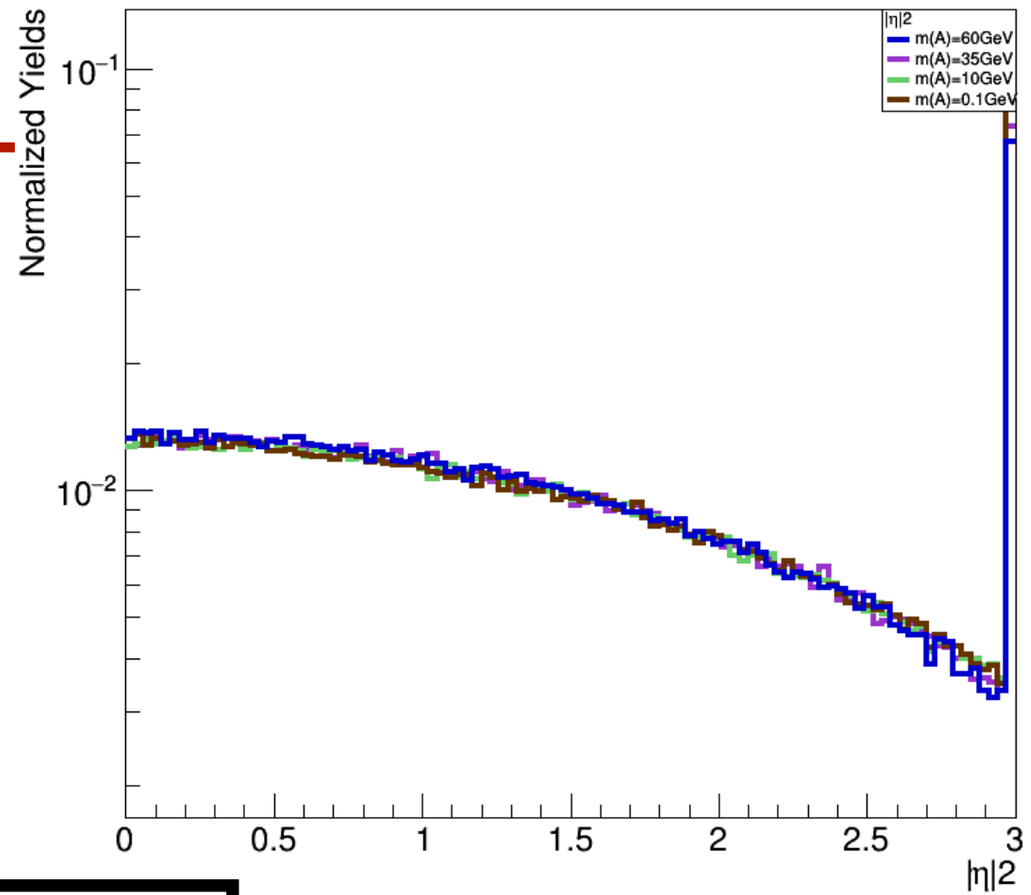
Gen Level distributions

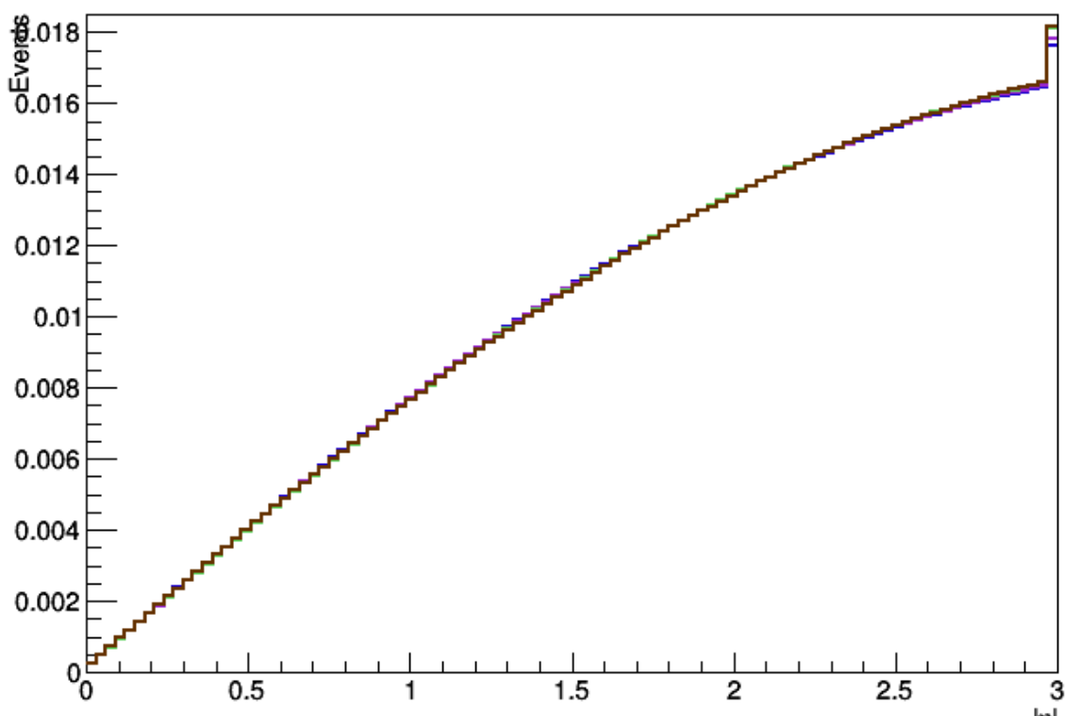
Photon 1

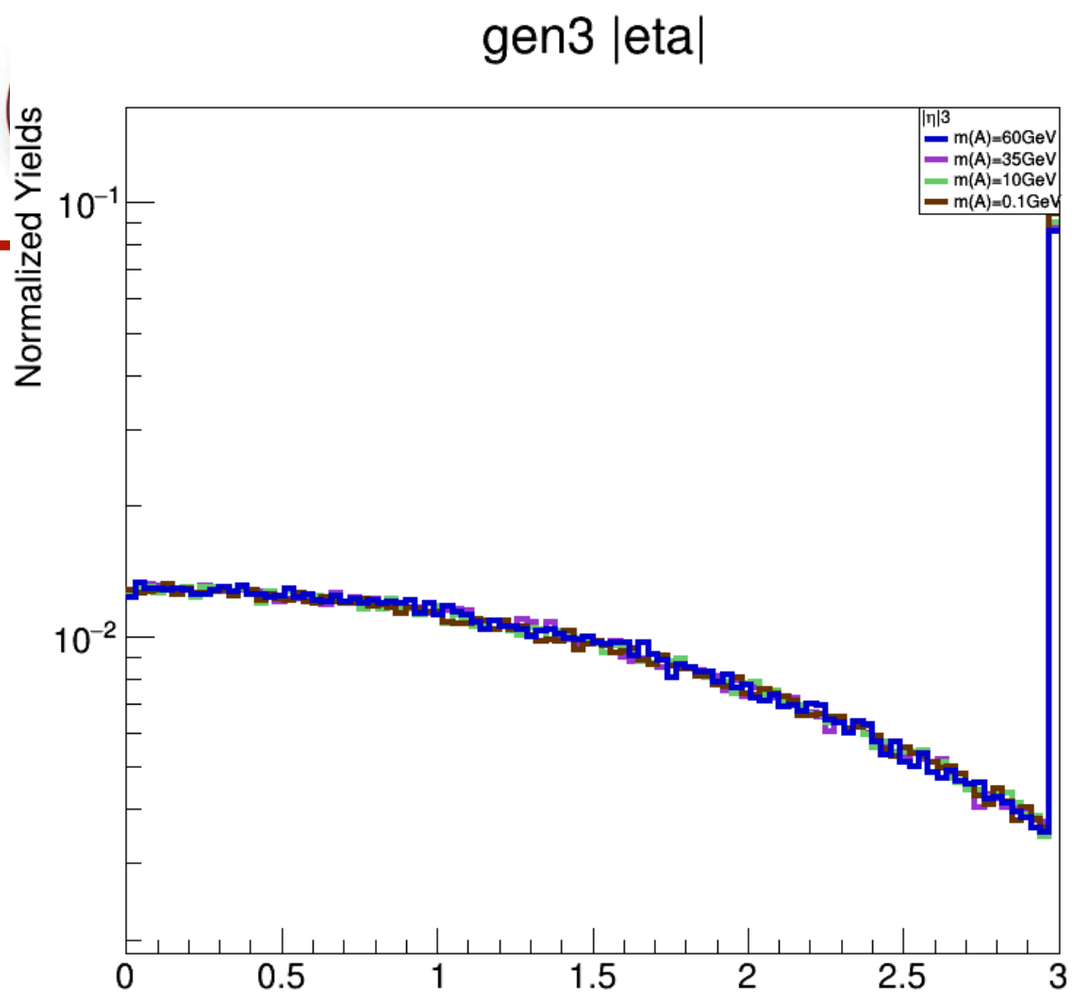


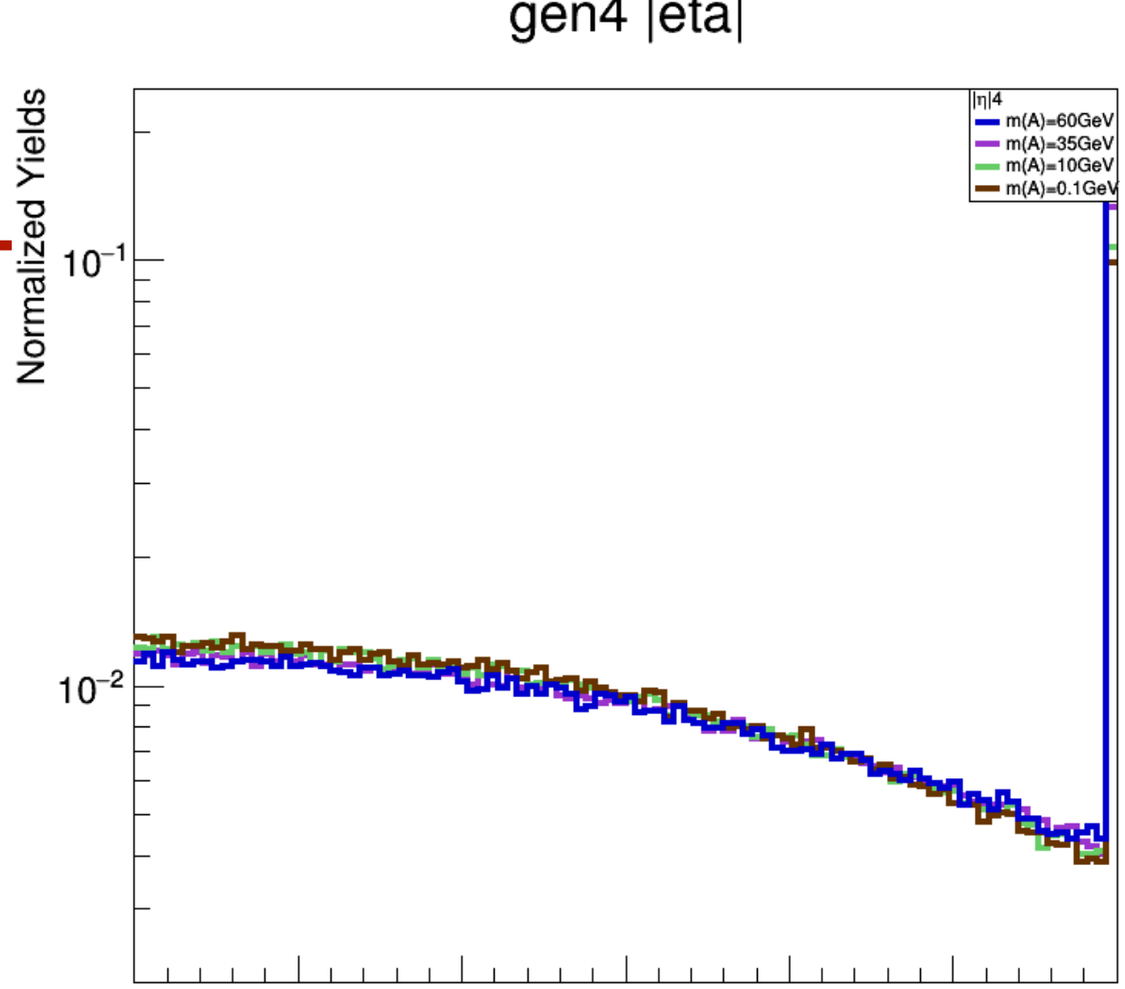


Photon 2

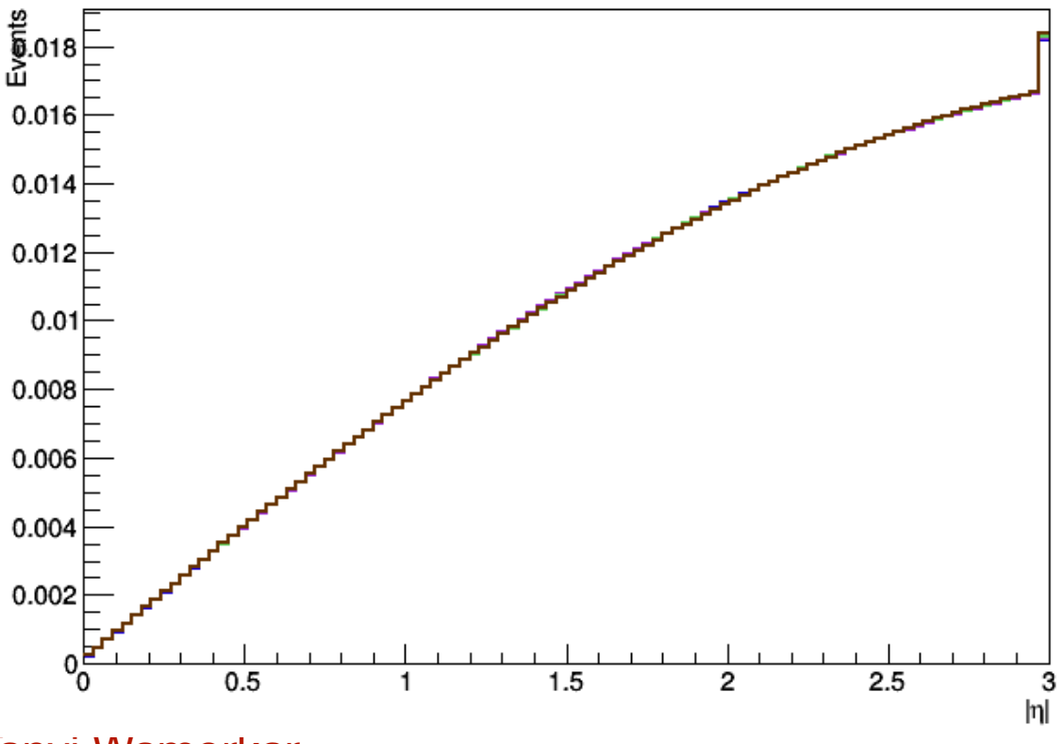




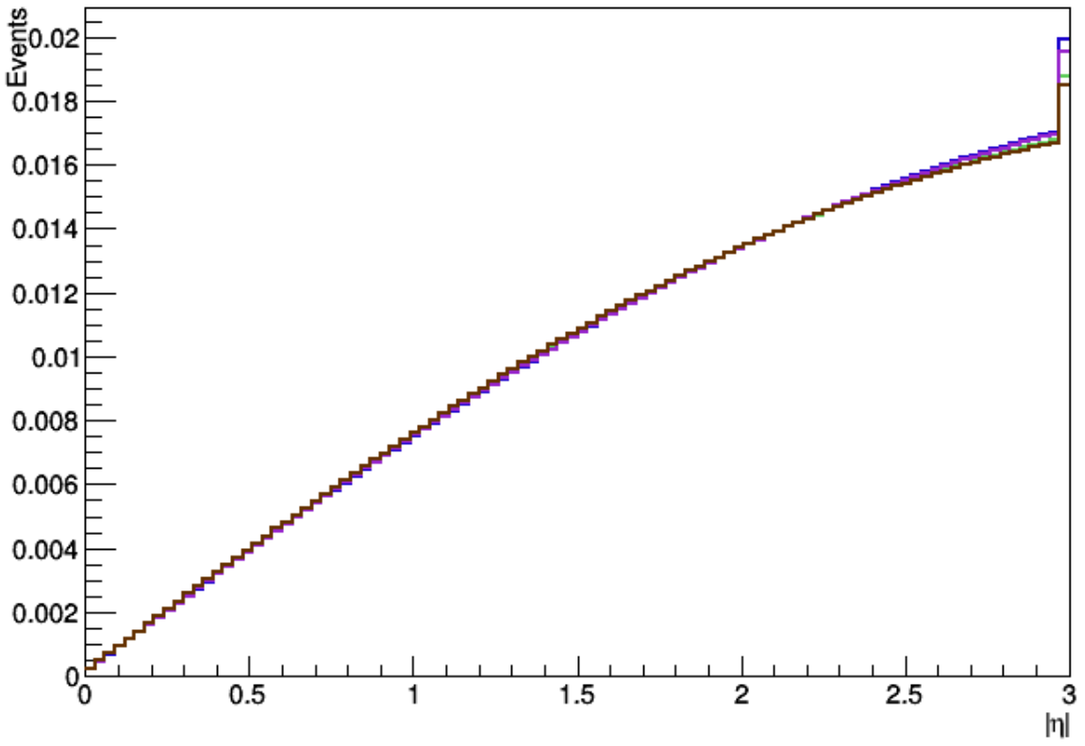




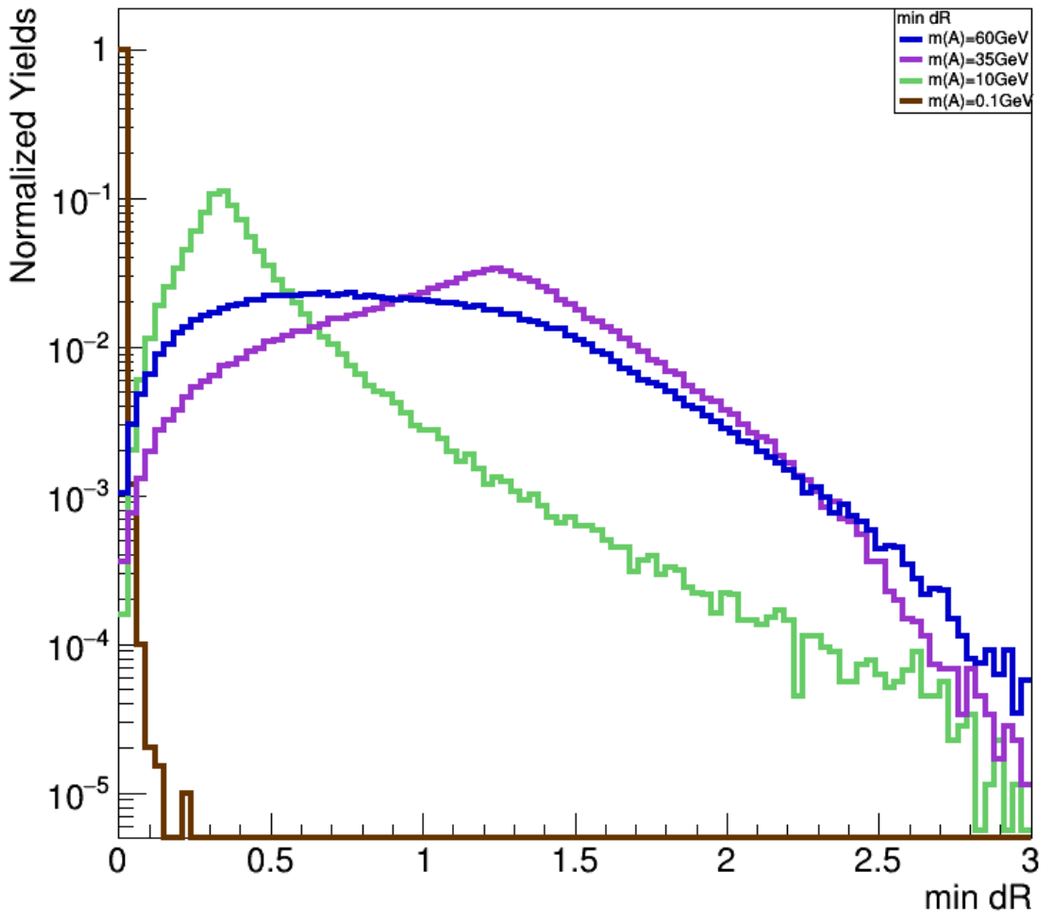
Photon 3



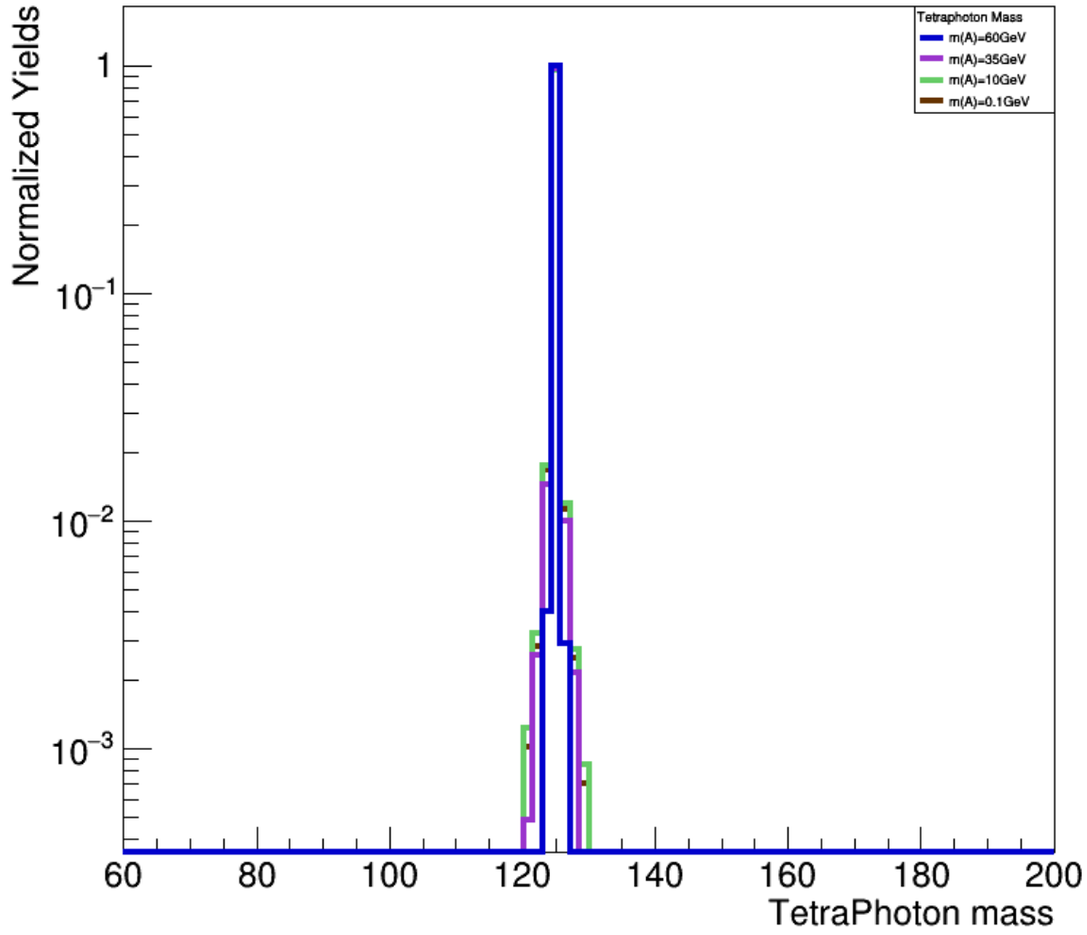
Photon 4



Gen Minimum Δ r



gen TetraPhoton Invariant mass



HLT_Diphoton30PV_18PV_R9Id_AND_IsoCaloId_AND_HE_R9Id_DoublePixelVeto_Mass55
HLT_Diphoton30EB_18EB_R9Id_OR_IsoCaloId_AND_HE_R9Id_DoublePixelVeto_Mass55

OR of the following L1 seeds

L1_SingleEG30	L1_SingleIsoEG28
L1_SingleEG32	L1_SingleIsoEG30
L1_SingleEG34	L1_SingleIsoEG32
L1_SingleEG36	L1_SingleIsoEG34
L1_SingleEG38	L1_SingleIsoEG36
L1_SingleEG40	L1_DoubleEG_15_10
L1_SingleIsoEG22er	L1_DoubleEG_18_17
L1_SingleIsoEG24er	L1_DoubleEG_20_18
L1_SingleIsoEG26er	L1_DoubleEG_22_10
L1_SingleIsoEG28er	L1_DoubleEG_22_12
L1_SingleIsoEG30er	L1_DoubleEG_22_15
L1_SingleIsoEG32er	L1_DoubleEG_23_10
L1_SingleIsoEG34er	L1_DoubleEG_24_17
L1_SingleIsoEG24	L1_DoubleEG_25_12
L1_SingleIsoEG26	