



A first look into
RS Gravitons
at ATLAS

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RS Gravitons Datasets



MC Dataset

- 3400 $G \rightarrow \gamma\gamma$ and 10200 $G \rightarrow ee$ Events:
- Generated with Mass = 1000 GeV $k/M_{pl}=0.1$
- Code version 11.0.42 and reconstructed with FullSim

Thanks to Barry King at Liverpool for generating the samples and producing ntuples.

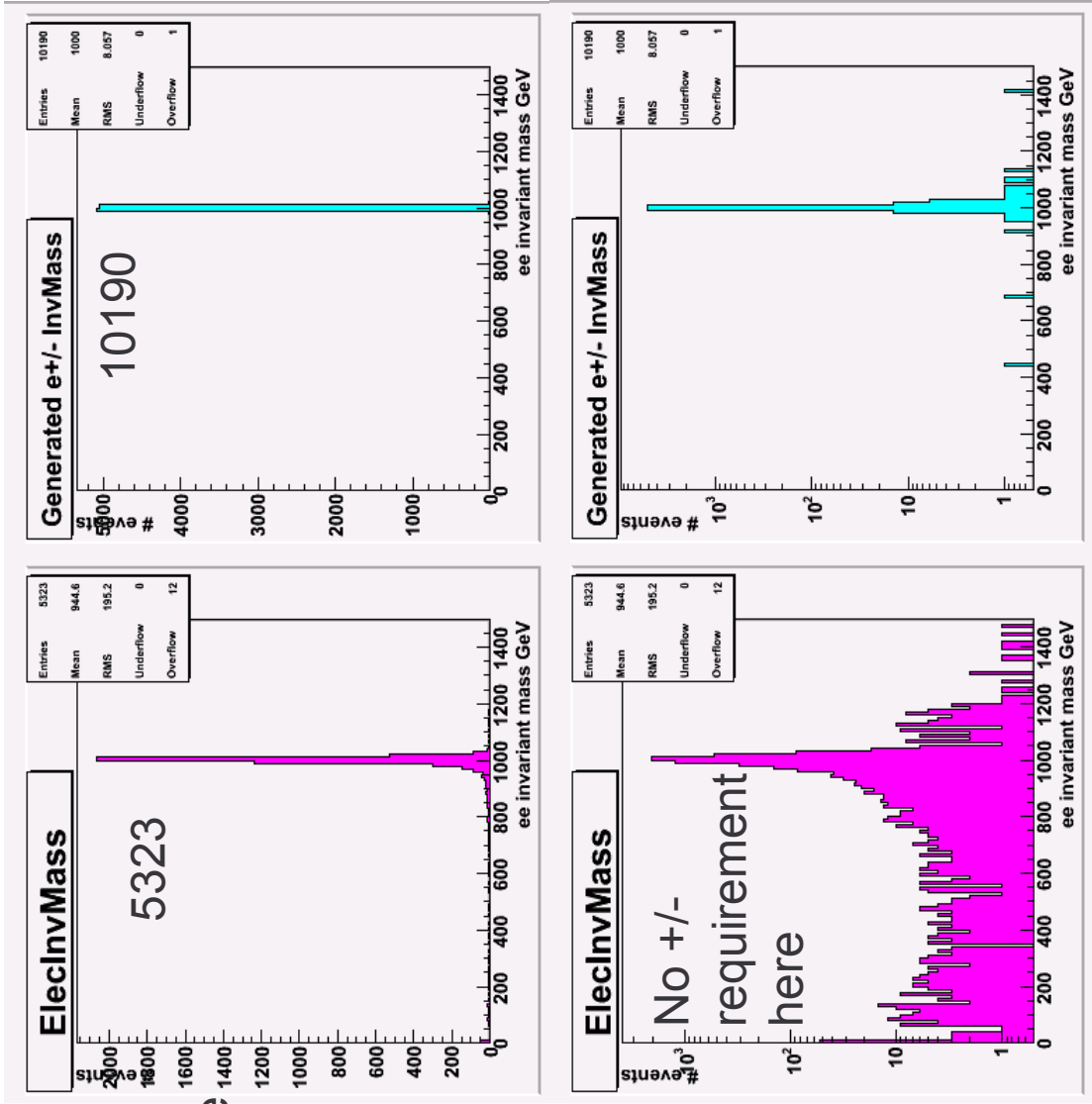
- Limited reconstruction information available. - can't trace mother/daughter - so just use the highest 2 Energy/Pt e/photons in the event for now to look at distributions.

More detailed investigations to follow in future....

ee Invariant Mass



Generator level invariant mass:
first two e^{+/-} with opposite charge
and with E > 100 GeV



Reconstructed mass:
highest energy 2 e^{'s} in the event
which pass the selection criteria

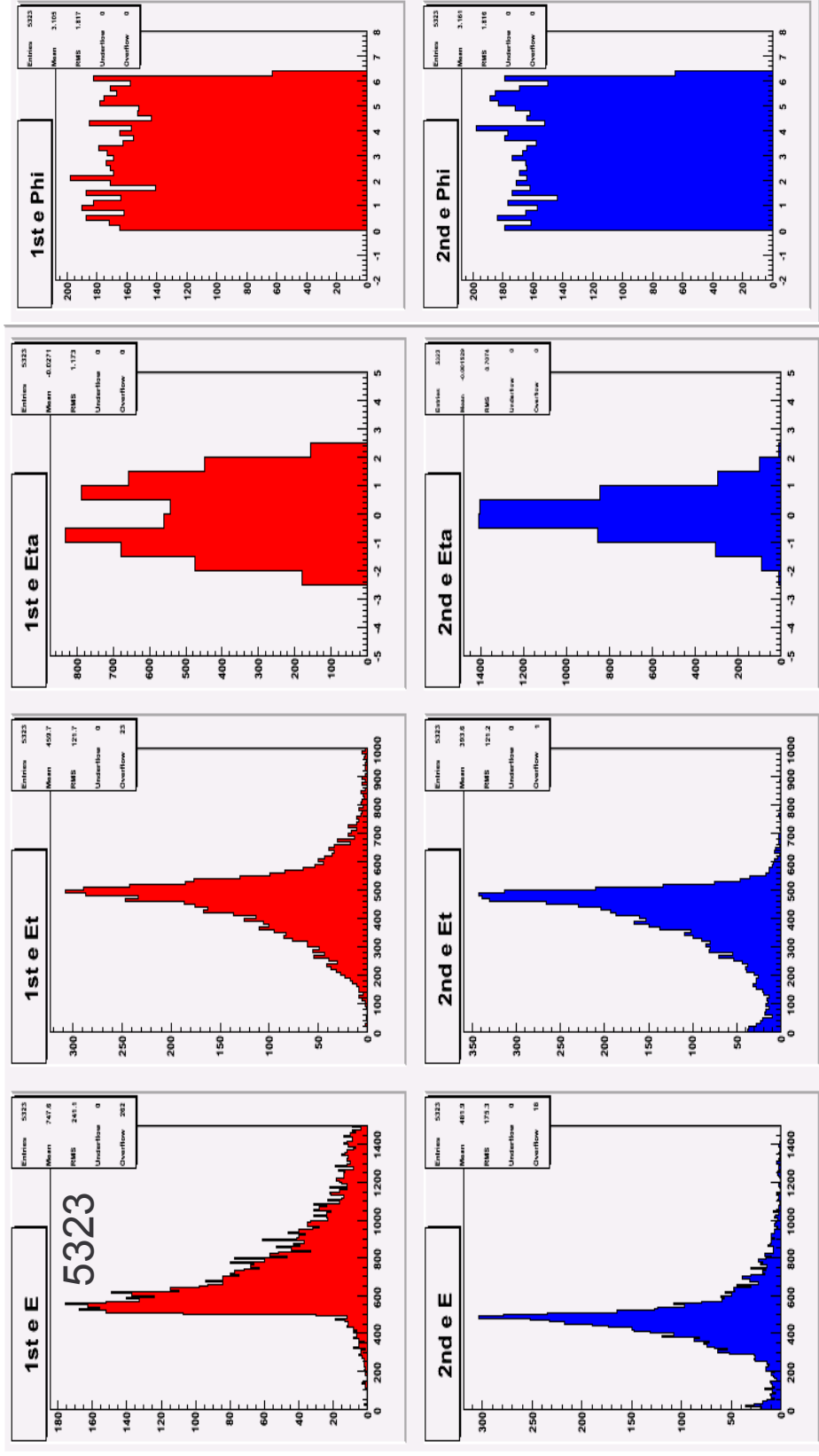
Reconstructed e/γ Selection Criteria



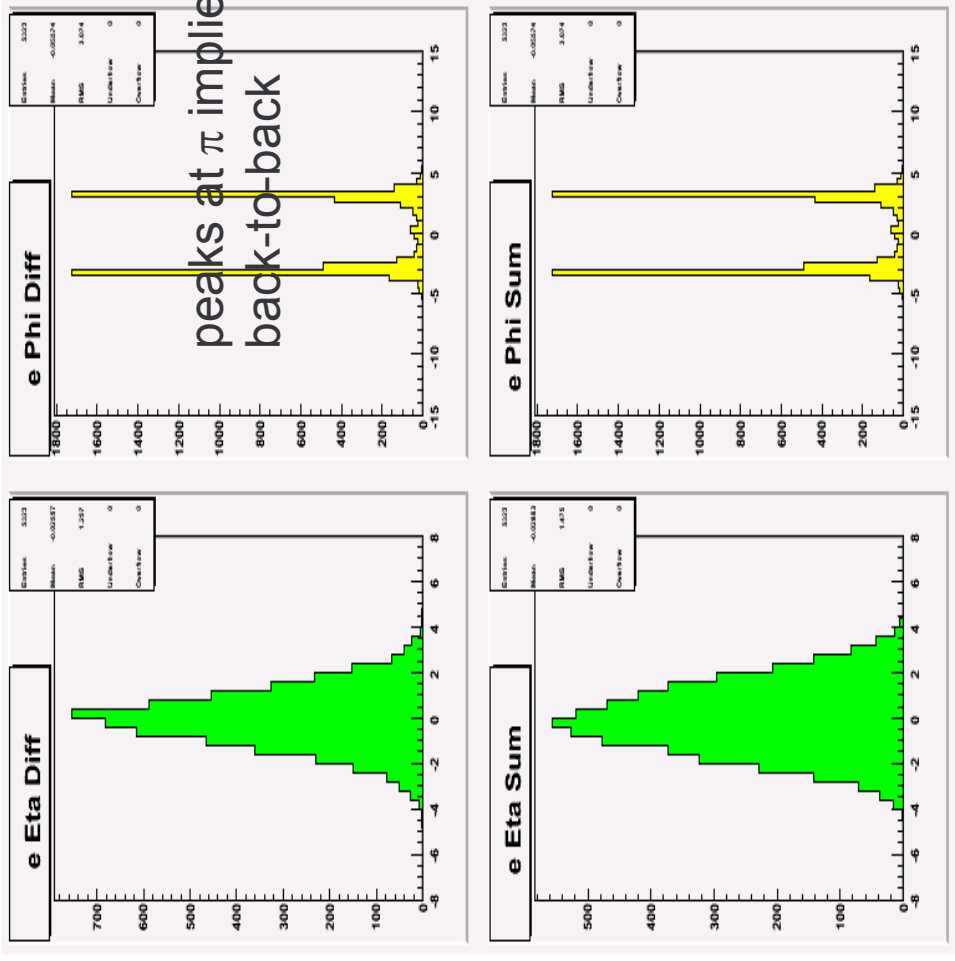
Electron:
Has a Track
isEMel==0
Pt > 5.0
|Eta|<2.5
E/P>0.5
WeightRatio>0.6
NBel + NPixel>0
NHitse| = NBel + NPixel + ElecNSCTHits[i-1] + ElecNTRTHits[i-1]> 5

Photon:
isEMphot==0
Etphot>5.0
|Eta|<2.5
Charge photon==0

Reconstructed e variables



$G \rightarrow ee$ Distributions



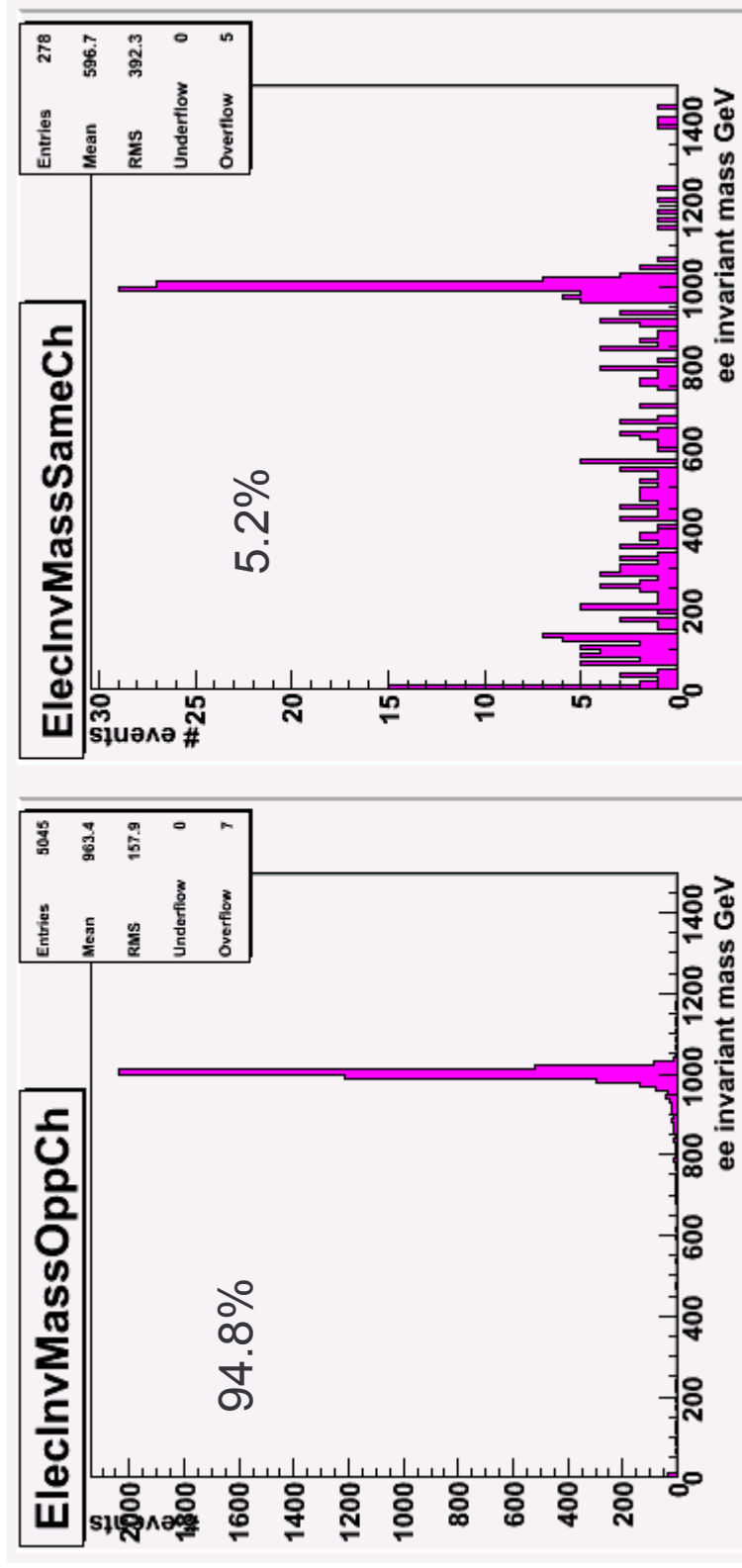
Charge Reconstruction



When more generator information available will match generated and reconstructed electrons

Reconstructed mass:

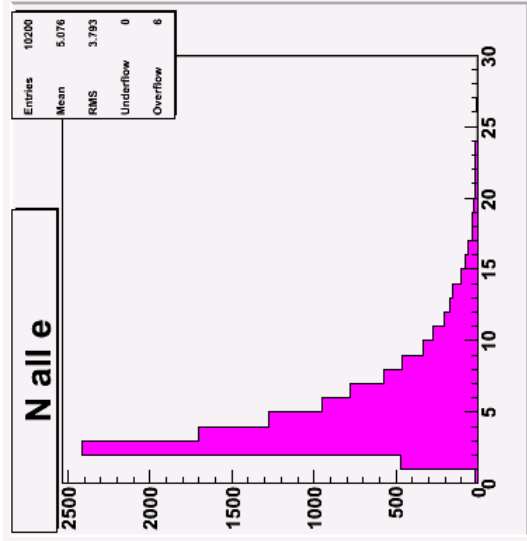
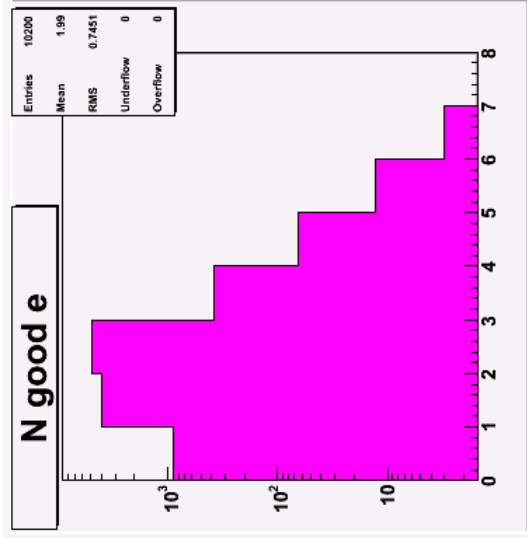
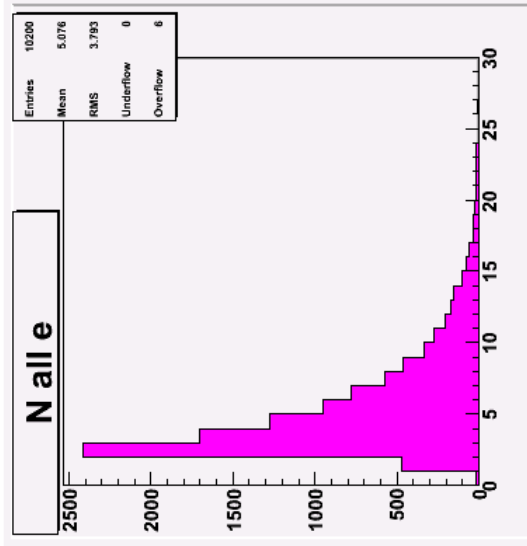
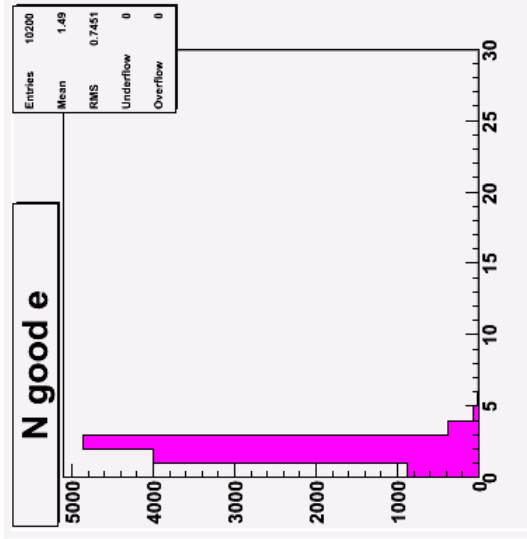
highest energy 2 e's in the event which pass the selection criteria

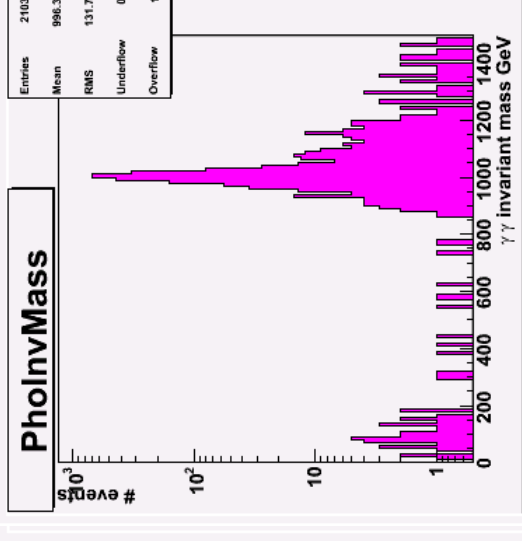
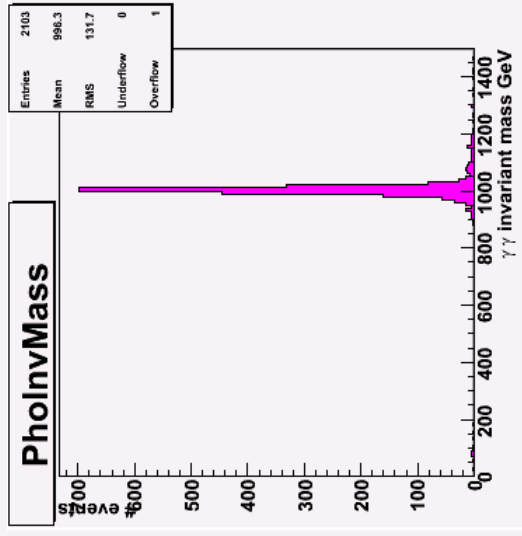
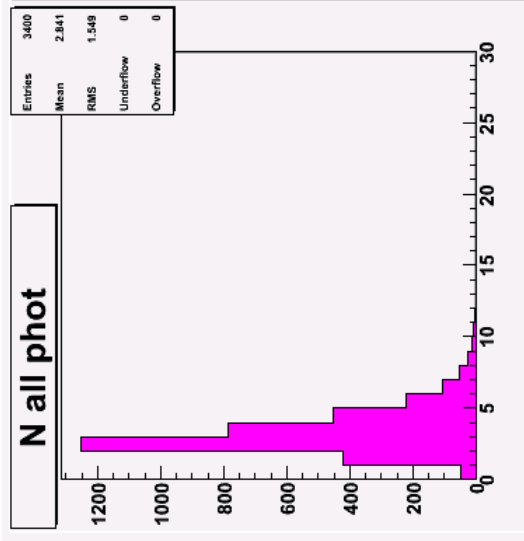
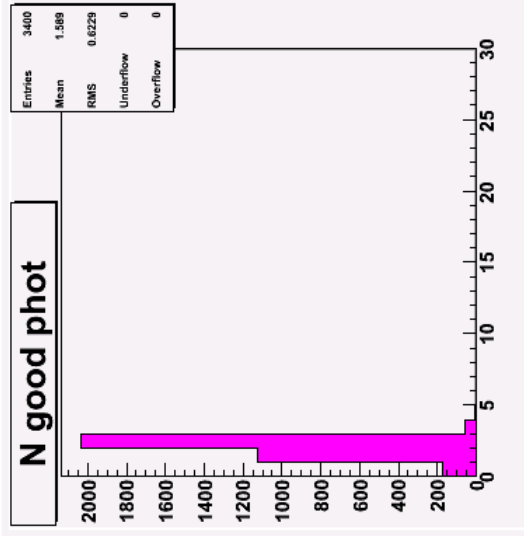


G → ee Events



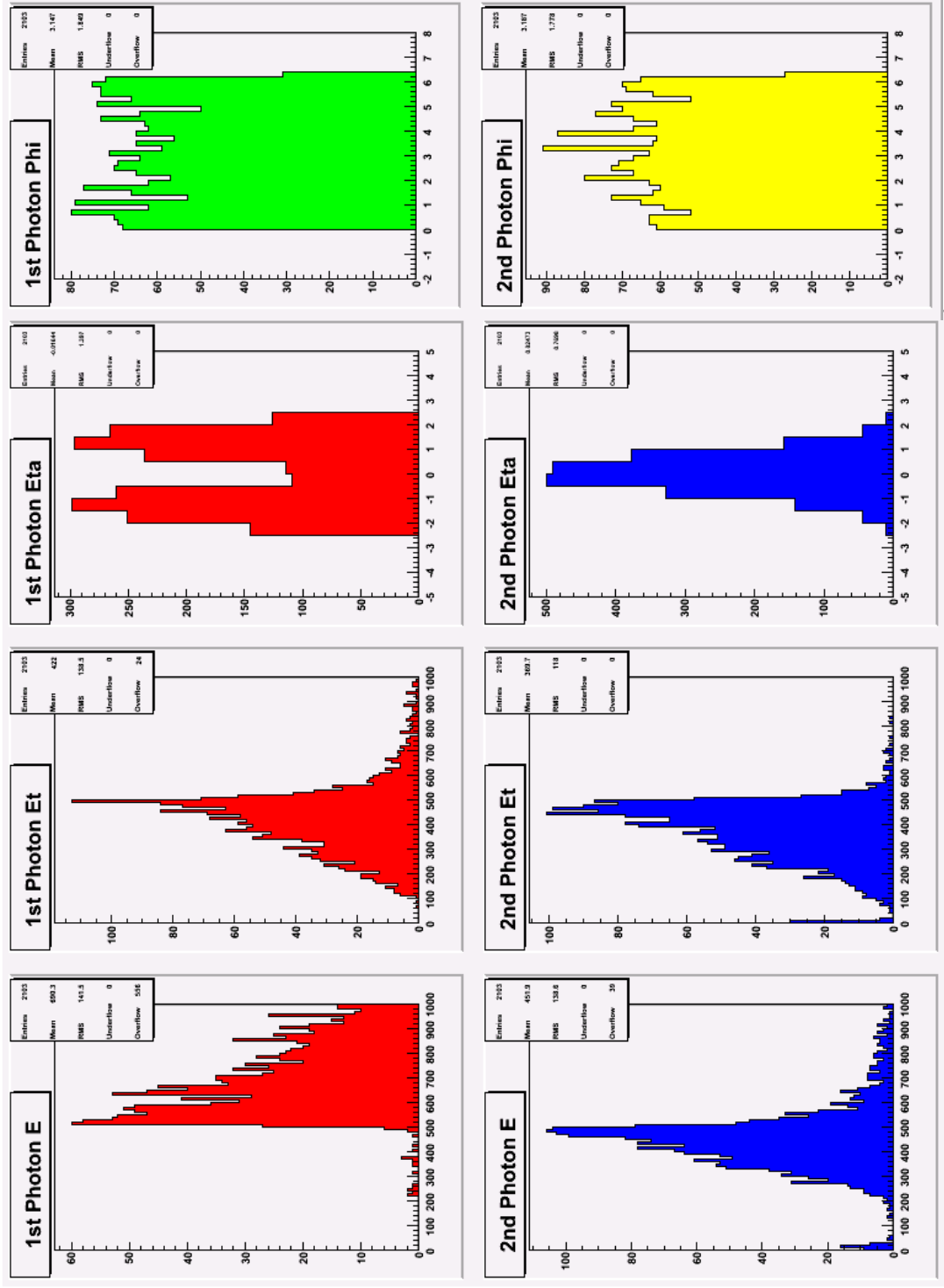
Most events have 1 or 2 “good” reconstructed electrons





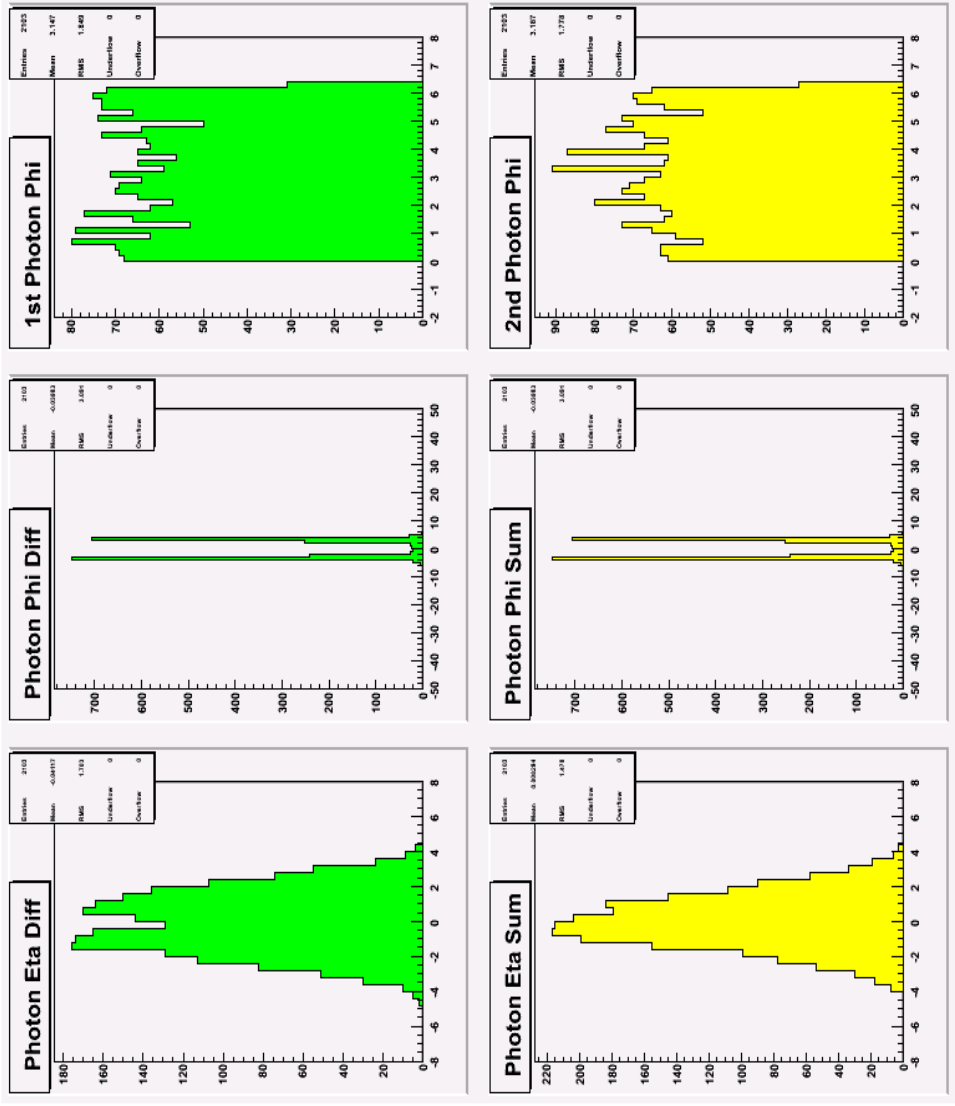
Reconstructed mass:
highest Et γ 's in the
event which pass the
selection criteria

2 Highest Et Photon Variables



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Reconstructed information



Future Plans



- Look at new samples which have more generator level information available.
- Look into reconstruction efficiency
- Investigate e/γ selection criteria
- Look into backgrounds