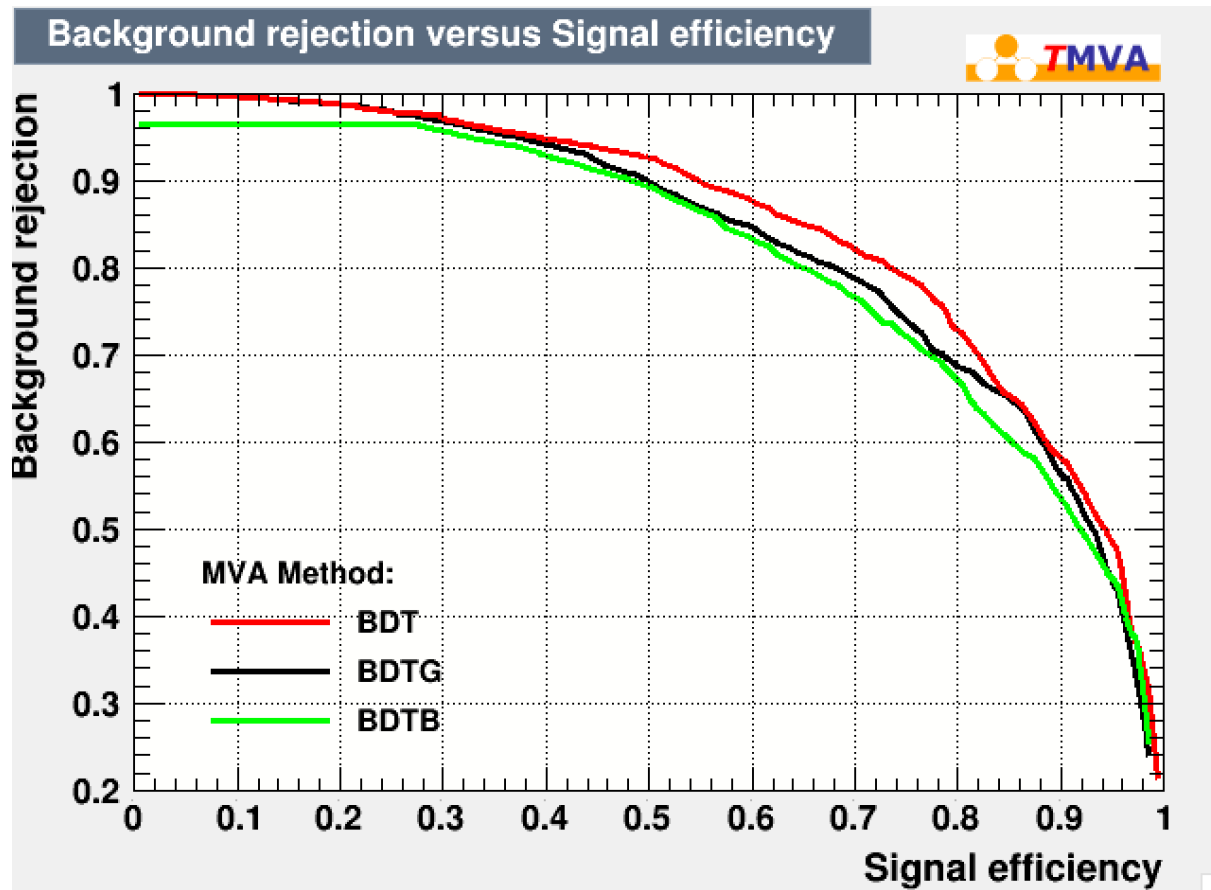


Weekly Report

Xin shuiting

25/11/2019



BDT>BDTG>BDTB
Didn't try DNN yet.

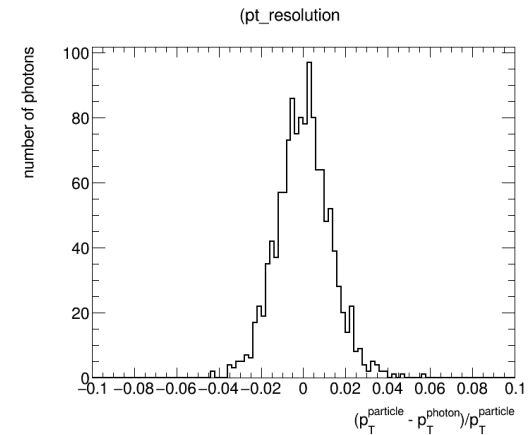
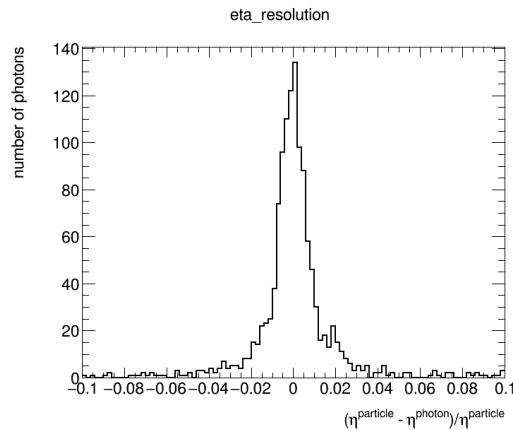
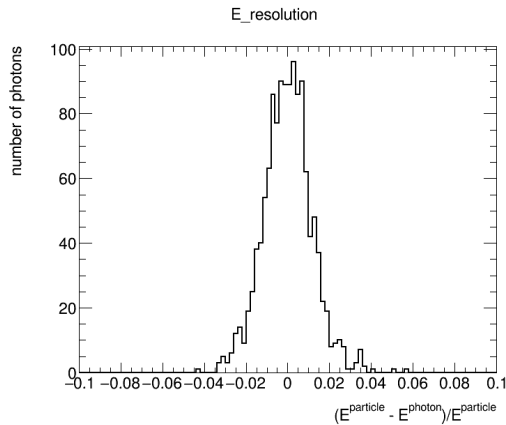
ggHSh signal production

Tools: Pythia and Delphes

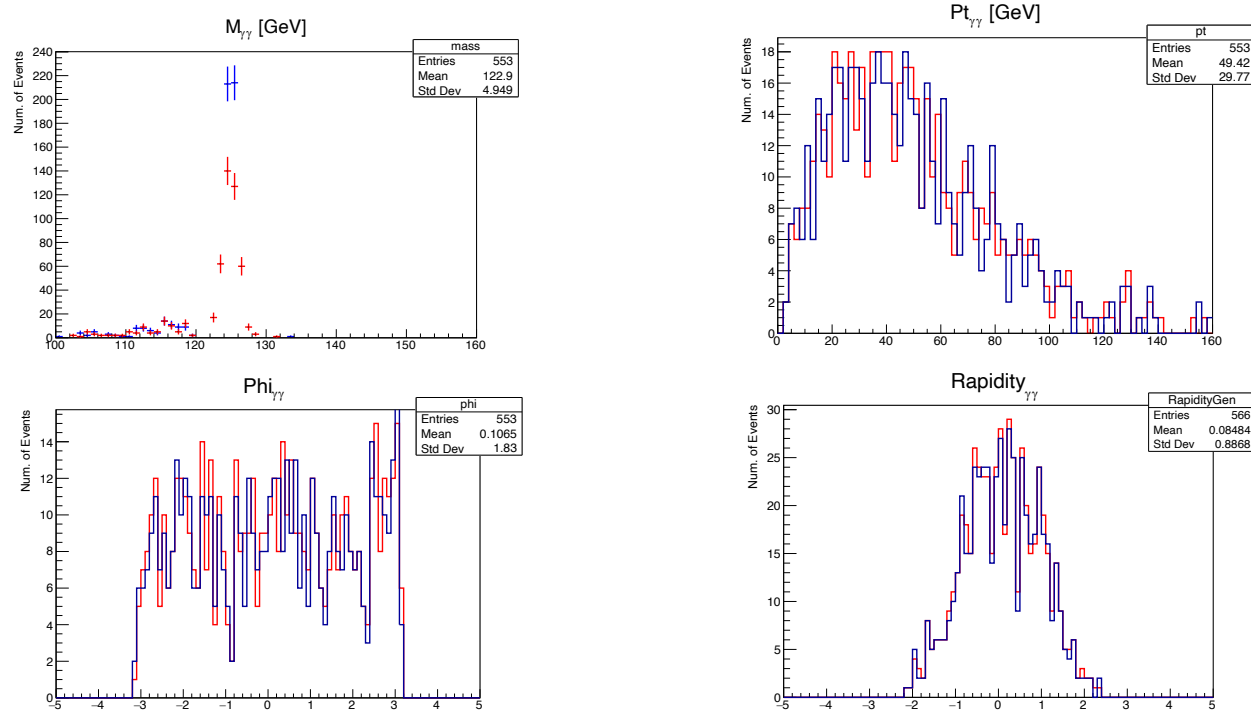
The Fiducial definition is given by

Objects	Fiducial definition
Photons	$ \eta < 2.37$ (excluding $1.37 < \eta < 1.52$), $\sum p_T^i/p_T^\gamma < 0.05$
Jets	anti- k_t , $R = 0.4$, $p_T > 30$ GeV, $ y < 4.4$
Diphoton	$N_\gamma \geq 2$, $105 \text{ GeV} < m_{\gamma\gamma} < 160 \text{ GeV}$, $p_T^{\gamma_1}/m_{\gamma\gamma} > 0.35$, $p_T^{\gamma_2}/m_{\gamma\gamma} > 0.25$

Requirements of photons are applied in resolution plots



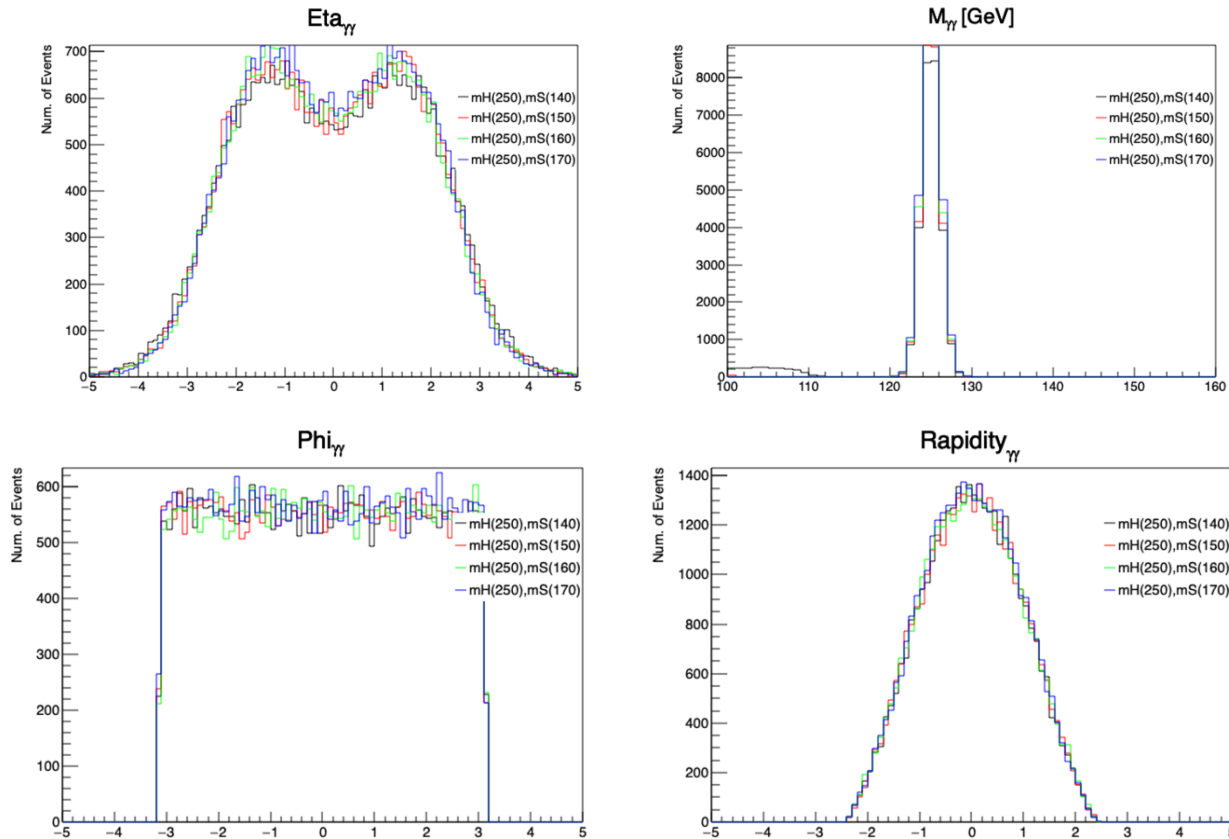
some distributions about Higgs.



DiPhoton events should satisfy the fiducial region, in which blue one is Gen-level and red one is reco-level after smearing.

Gen-level: GenParticle class
Reco-level: Photon. class

Mass scan $m_H(250,260,270), m_S(140,150,160,170)$



Next step:

Get the rapidity and the Higgs PT in the fiducial region with the TRUTH information with the same binning at ATLAS.

To understand if the BSM production predicts more centrally produced Higgs boson compared to the SM.

Backup

Impact on Higgs Physics

The presence of a BSM signal of the type $H \rightarrow Sh$ would lead to:

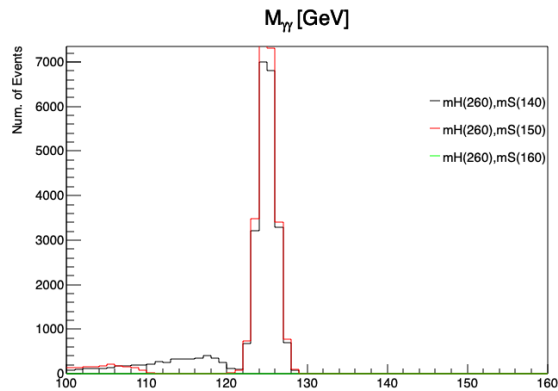
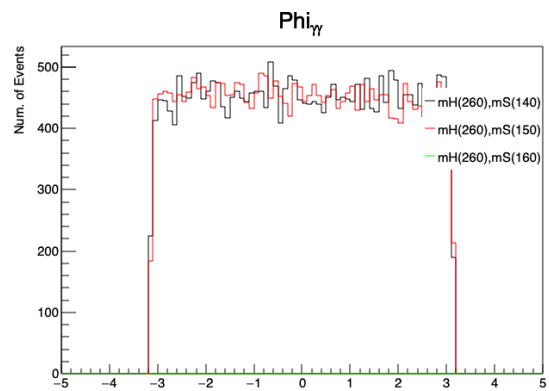
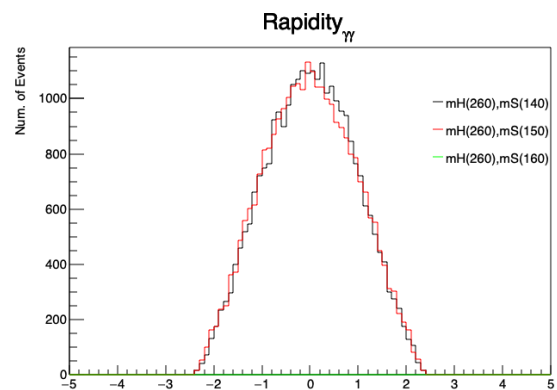
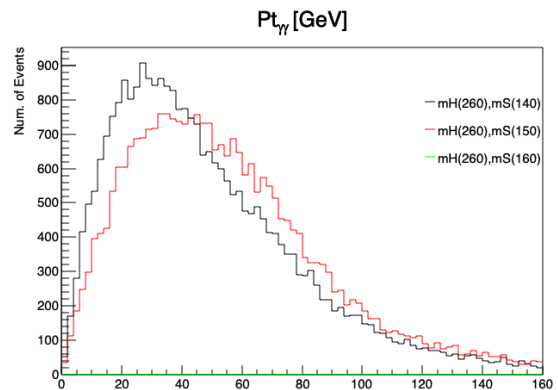
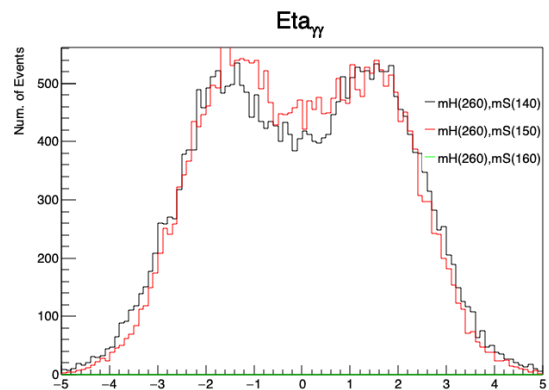
❑ Elevated cross-sections

- **Currently the measured h signal strength is**

$$\mu = 1.133 \pm 0.054(\text{exp.})$$

❑ The presence of extra leptons in association with h . Affects the Wh measurement

❑ Distortion of Higgs p_T and rapidity (under study)



Some of those job failed

