- New ntuples from Enrico

- Collection: UFO_PFLOW

- In the merged ggF case:

  - number of Zjets events: 518626
  - number of Diboson events: 55984
  - number of Radion events: 295880

- Masses:

  (800, 1600, 2400, 4000, 1400, 1000, 1800, 2600, 3500, 1200, 2000, 6000, 500, 4500, 3000, 600, 1500, 700) GeV

Observed differences between our NN and the one described in the internal note (2020):

|	Our NN	paper
Layers	2	4
Nodes	32	128
Optimizer	RMSprop	Adam
Learning rate	0.001	0.0003
Patience	10	5
Epochs	150	200
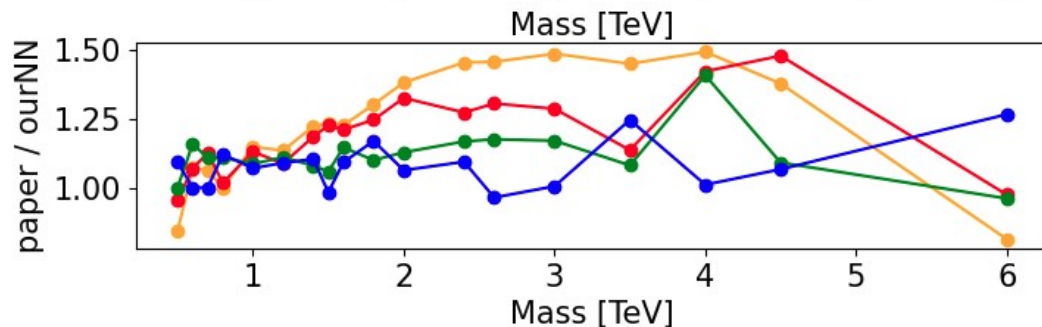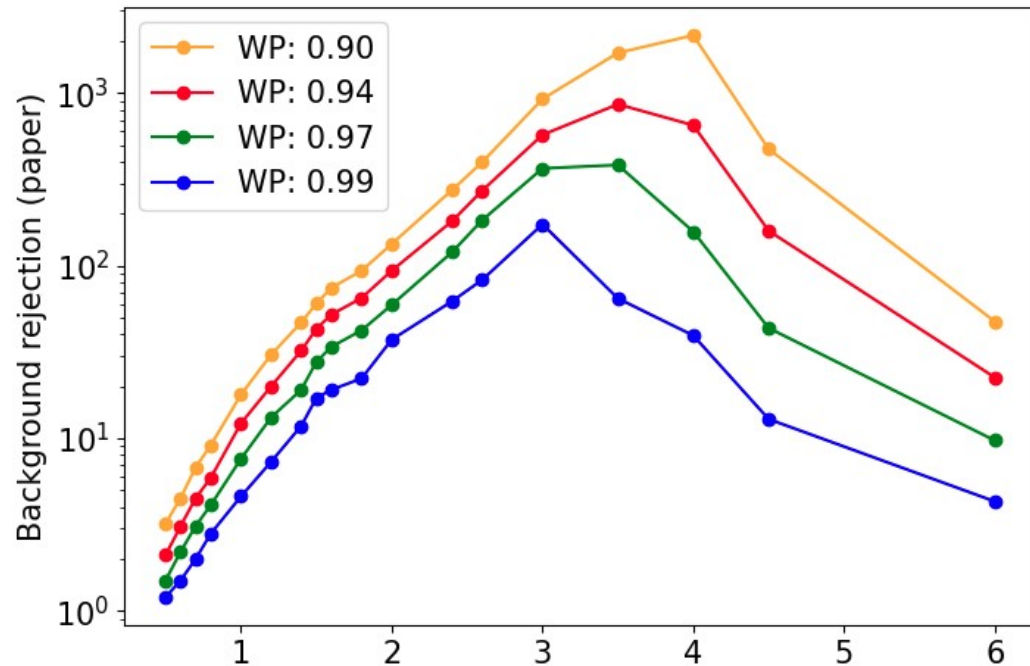
Overall improvement with the parameters in the paper → chosen as default configuration

Found bug in the calculation of the weights

Comparison between background rejection after fixing the bug (top) and those in the previous slide

(Small) overall improvement
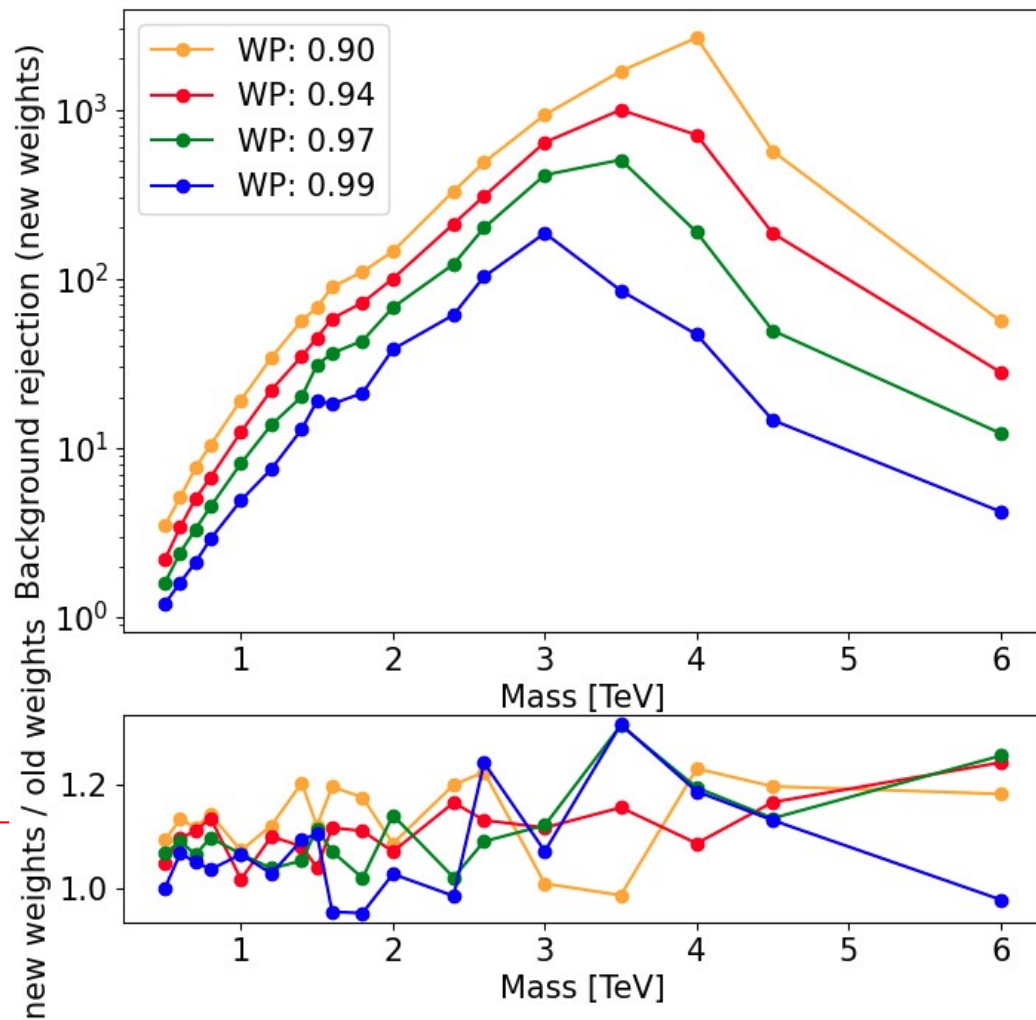
Variables with distribution spread on a small range and similar for signal and background:
- fatjet_D2
- fatjet_m
- fatjet_pt
- lep1_pt
- lep2_pt
- Zcand_pt

Variables with distribution spread on a small range and similar for signal and background:
- fatjet_D2
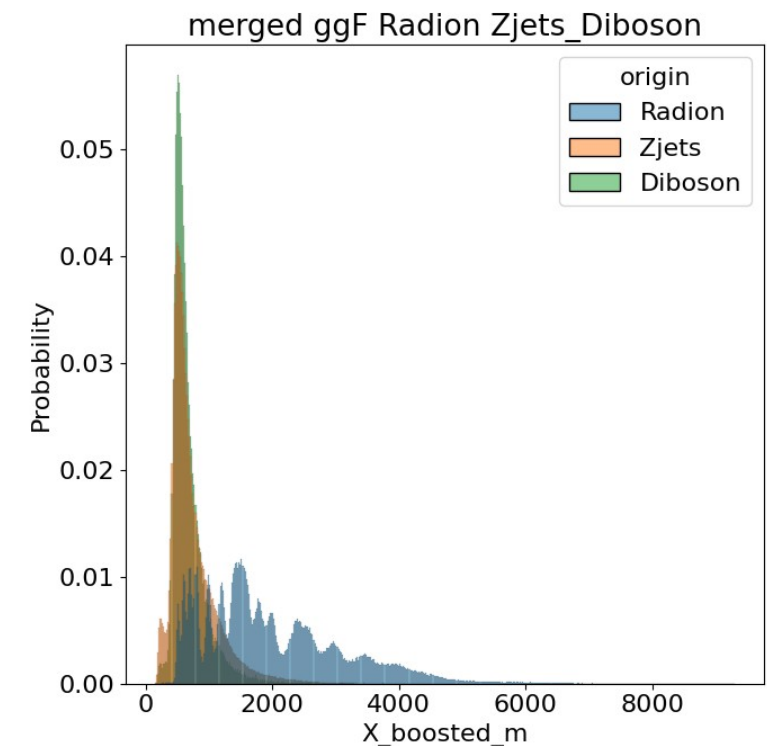- fatjet_m
- fatjet_pt
- lep1_pt
- lep2_pt
- Zcand_pt

Logarithm of these variables used as input of the PDNN

Comparison with the background rejection in the previous slide

Small improvement → restoring true variables as input of the PDNN
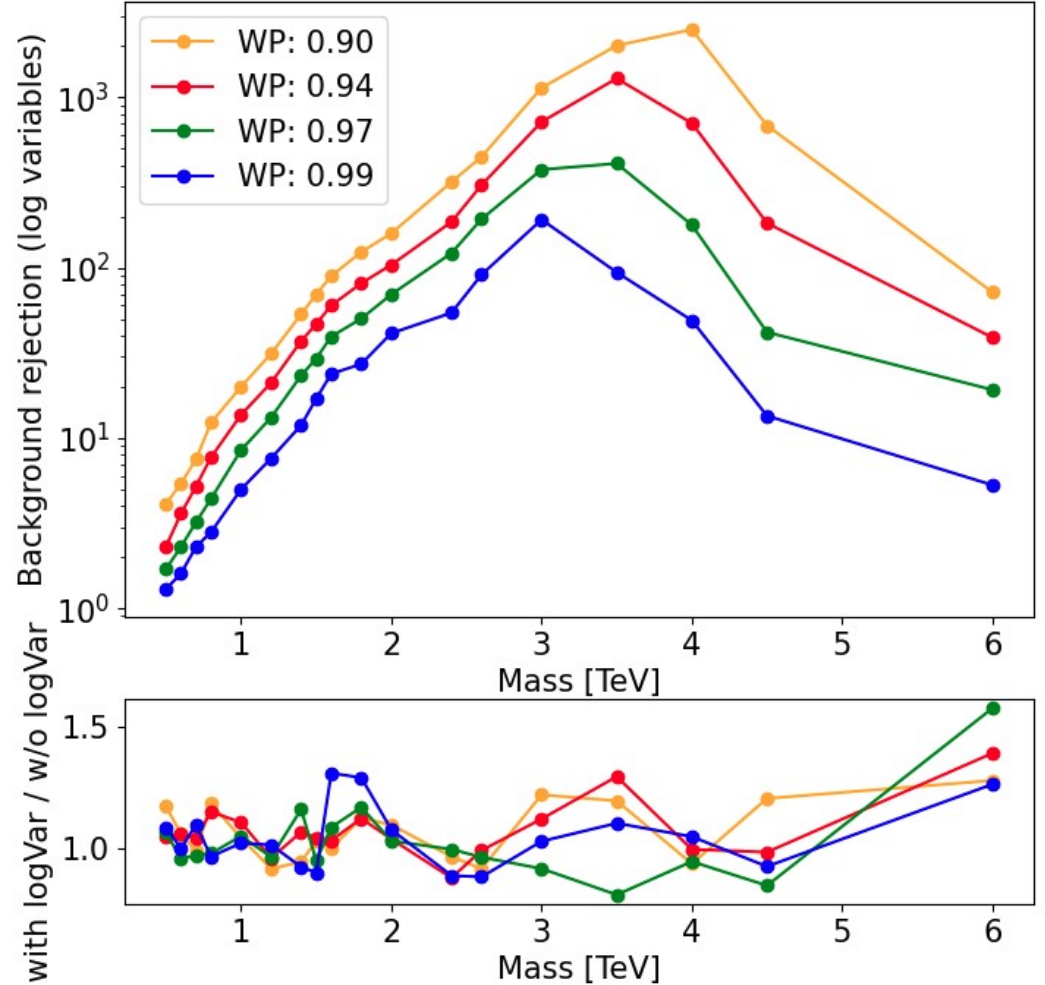
Added Xboosted_m as input feature

merged ggF Radion Zjets_Diboson
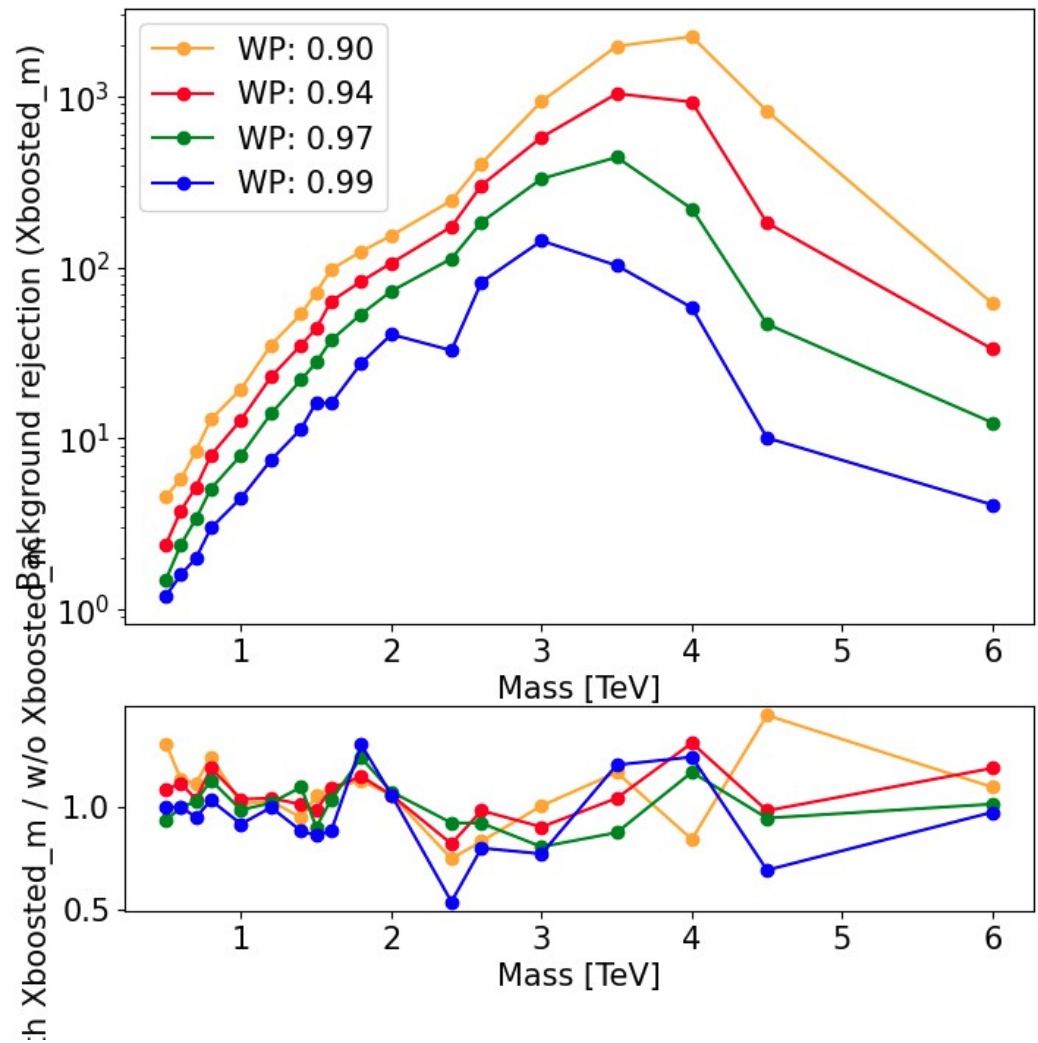
Hypothesis: if the background has a uniform mass distribution and the signal mass distribution has a peak around one value a background event with that mass could be interpreted as signal → we assigned to the background a random value according to the signal mass distribution
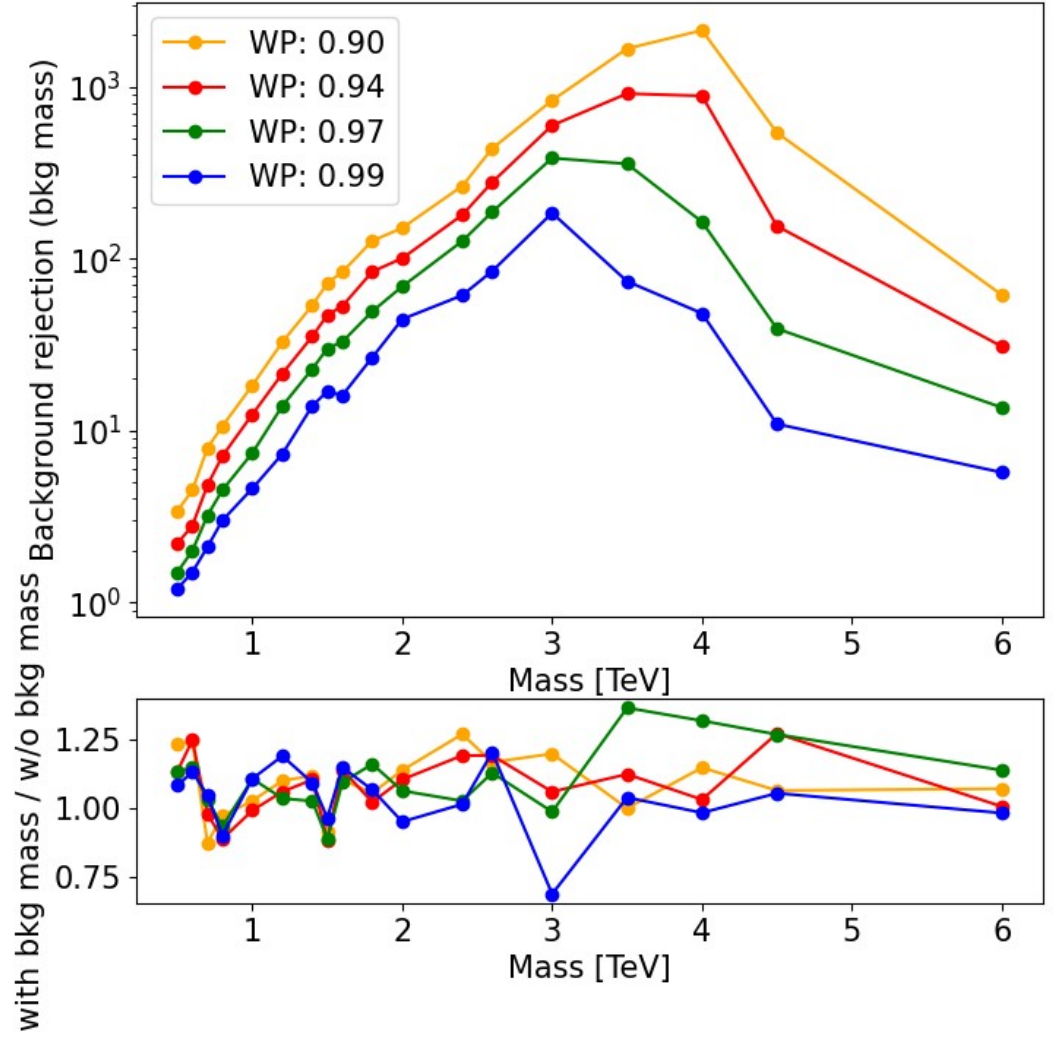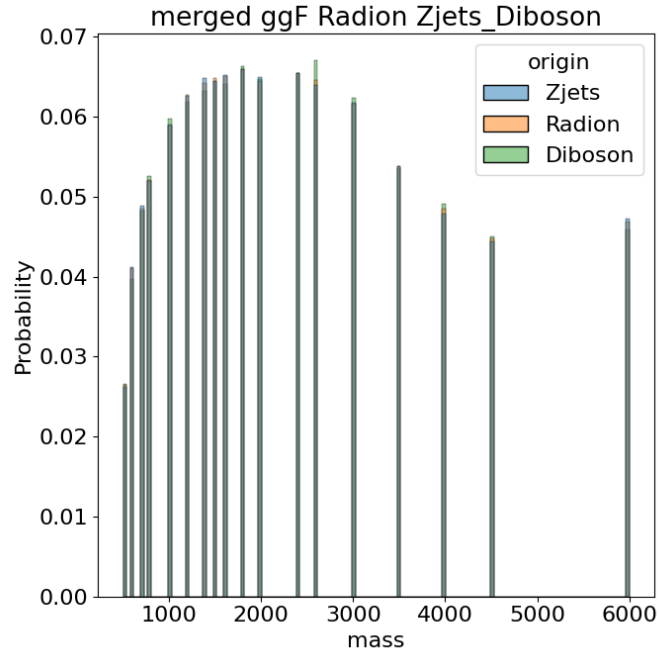
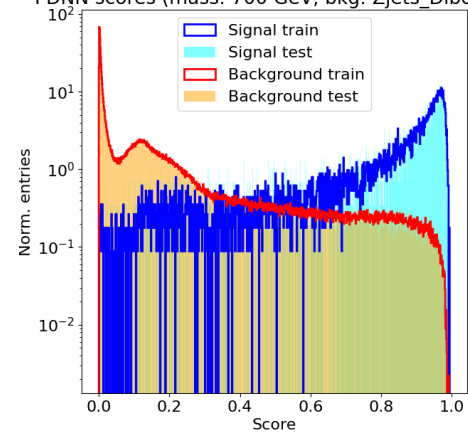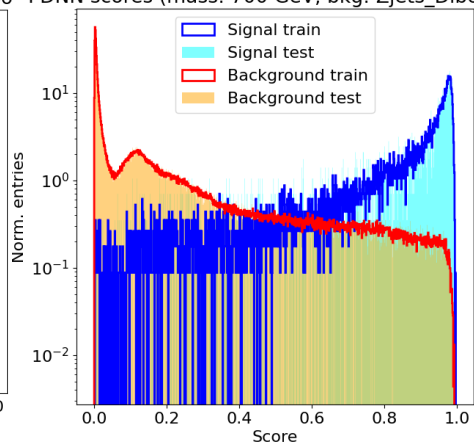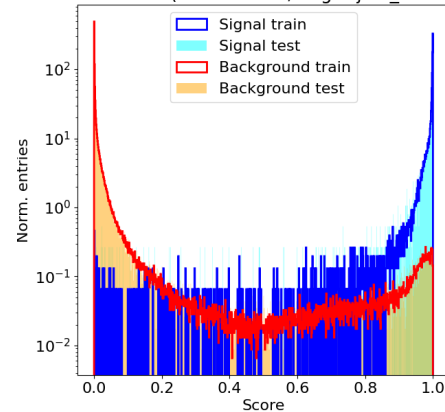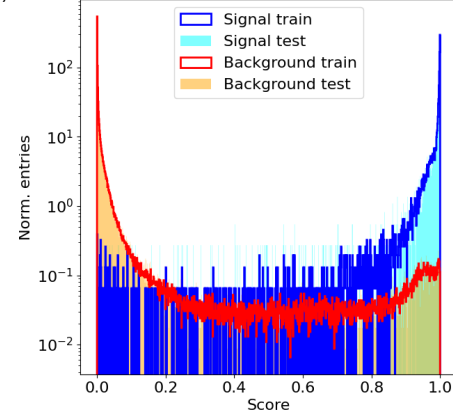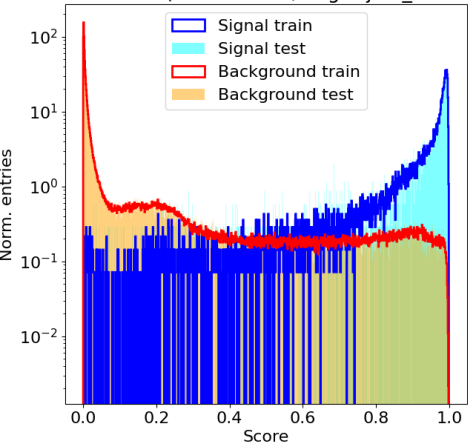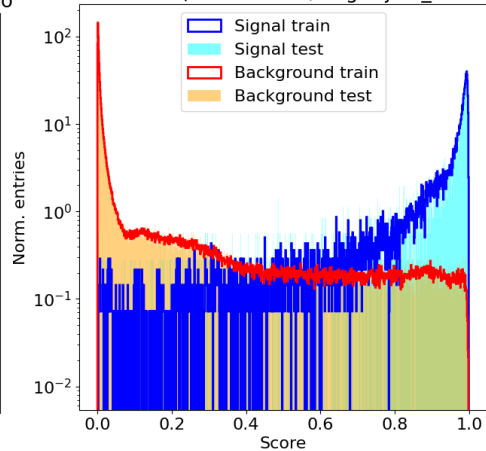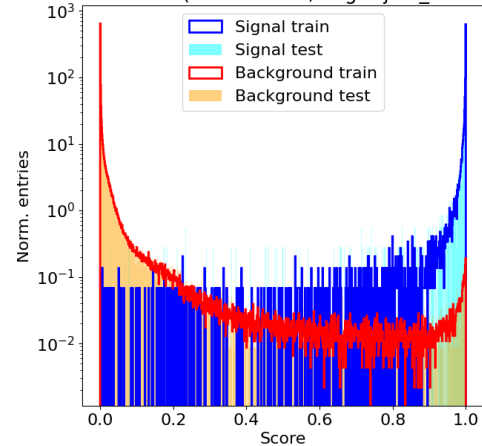merged ggF Radion Zjets_Diboson

Uniform

Signal-like

Uniform
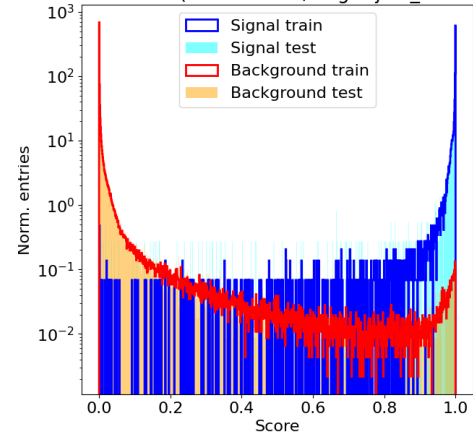
Signal-like

Uniform
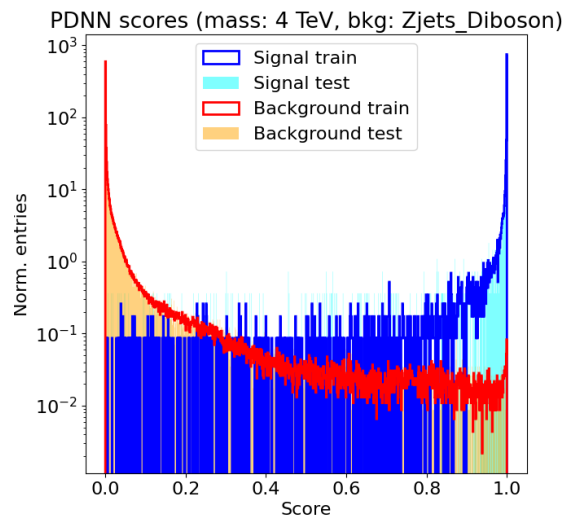
Signal-like
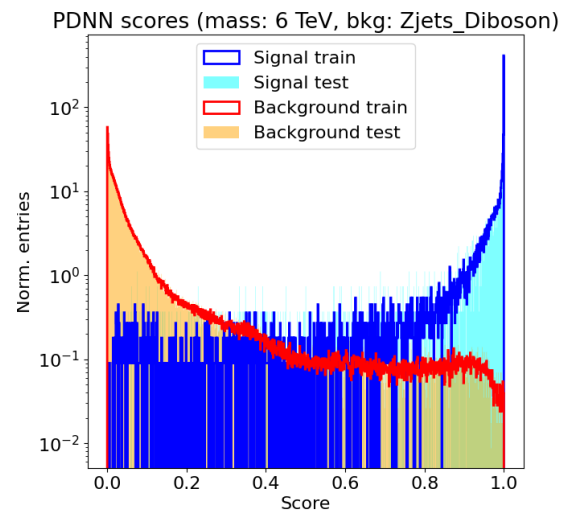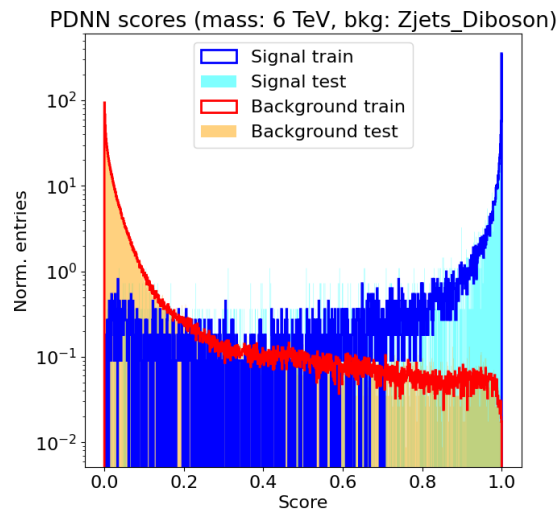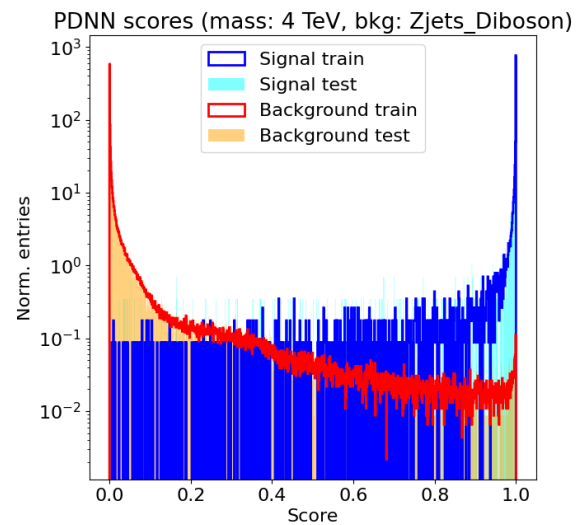
Scaling train and test dataframes according to the median and the interquartile range (of the train sample) instead of mean and sigma