

Architectures comparison

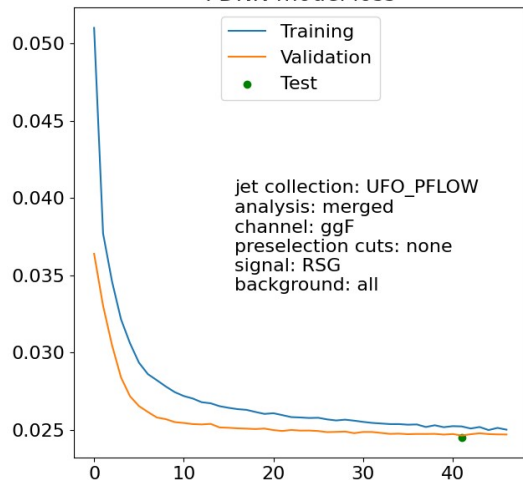
	Internal note	Looser architecture
Number of nodes	128	32 (merged) – 50 (resolved)
Number of layers	4	2
Dropout	0.2	0.3
Optimizer	Adam	
Learning rate	0.0003	0.001
Number of epochs	200	
Early stopping	Patience = 5	
Monitor	Accuracy on validation	

(internal note of Eur. Phys. J. C (2020) 80:1165, [ATL-COM-PHYS-2018-1549](#))

RSG ggF

merged

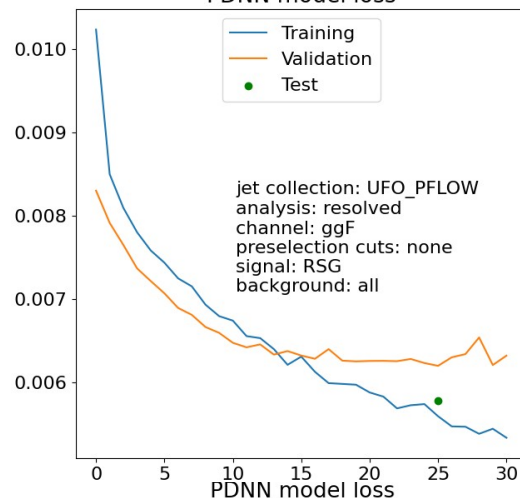
PDNN model loss



deep

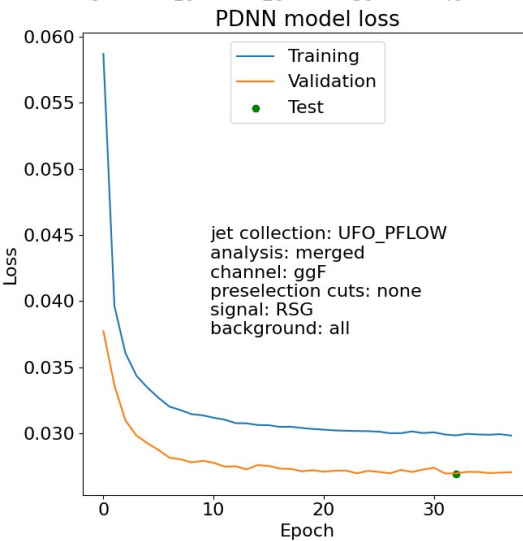
resolved

PDNN model loss

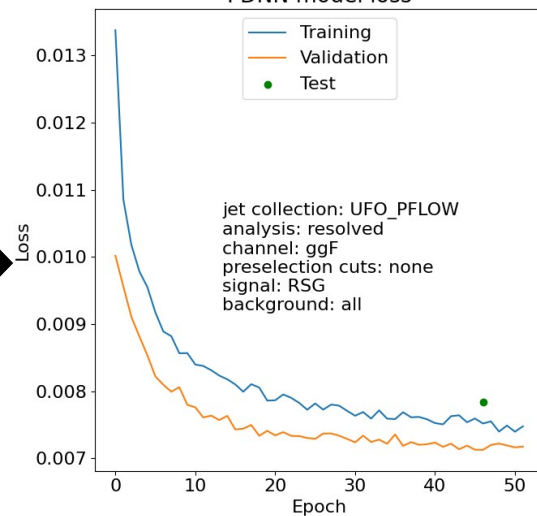


Maggiore separazione nelle ultime epoche, senza early stopping la rete più spinta sarebbe andata in overtraining

Loss migliore con rete loose

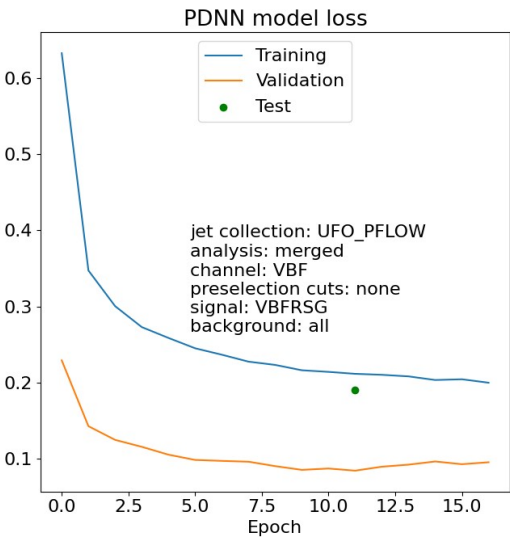
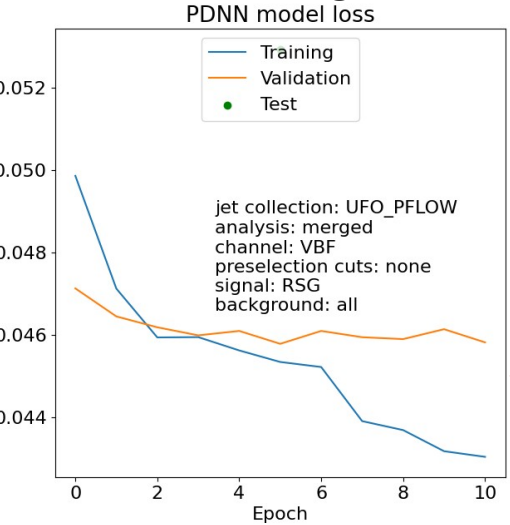


loose



RSG VBF

merged

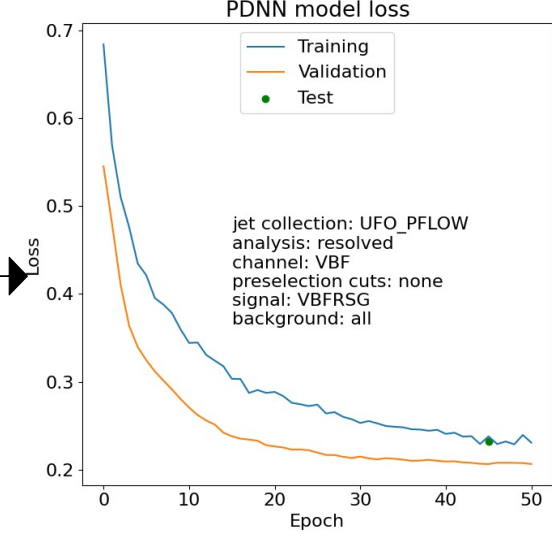
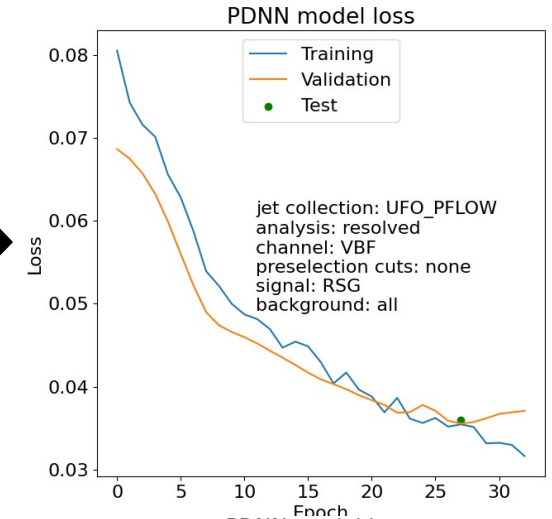


deep

Loss migliore nel caso loose.
Alta separazione tra training e validation nel caso loose → diminuire dropout

loose

resolved

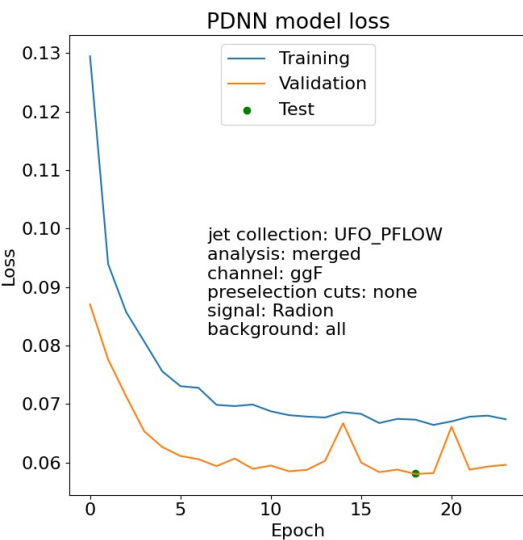
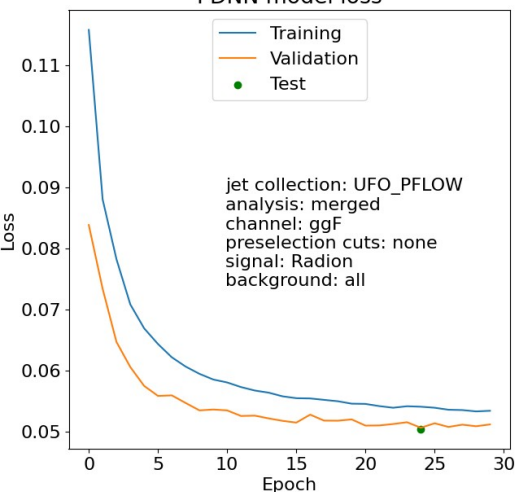


Loss migliore con rete loose

Radion ggF

merged

PDNN model loss



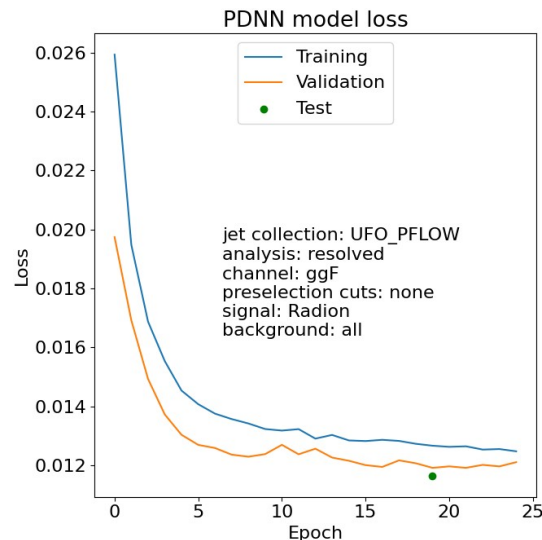
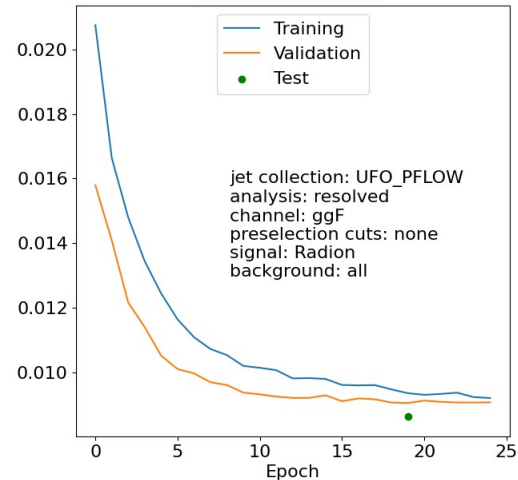
Le spike nella validation potrebbero essere dovute a pesi MC estremamente alti o bassi. Si possono individuare questi eventi, rimuoverli dal train set e guardare la shape delle variabili di input. Se non cambia significativamente allora si possono rimuovere definitivamente questi eventi dal train

deep

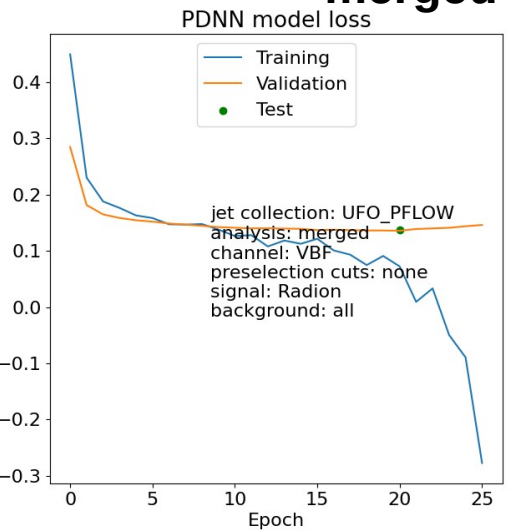
loose

resolved

PDNN model loss

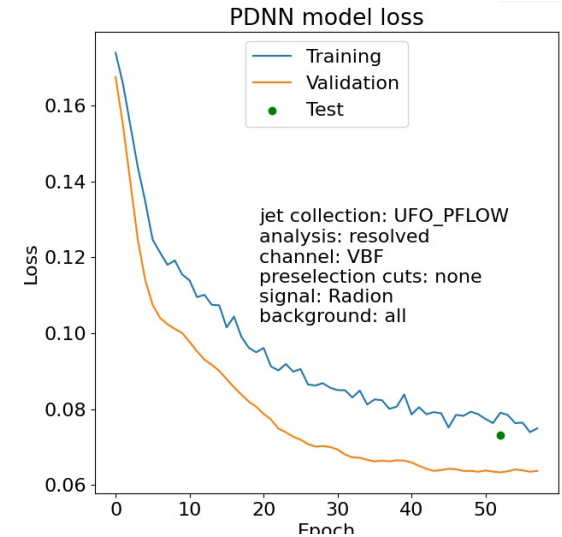


Radion VBF merged

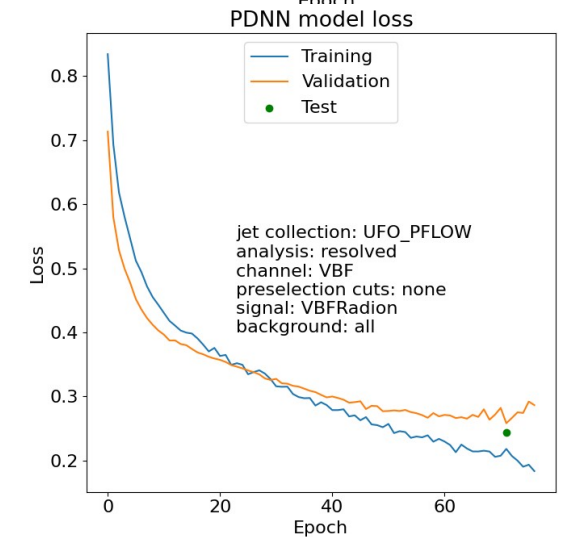
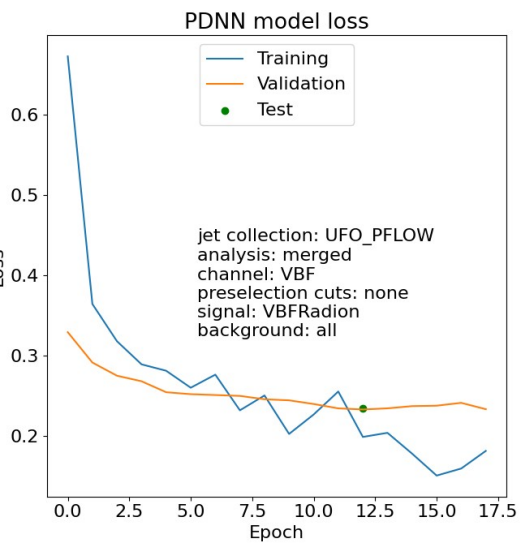


deep

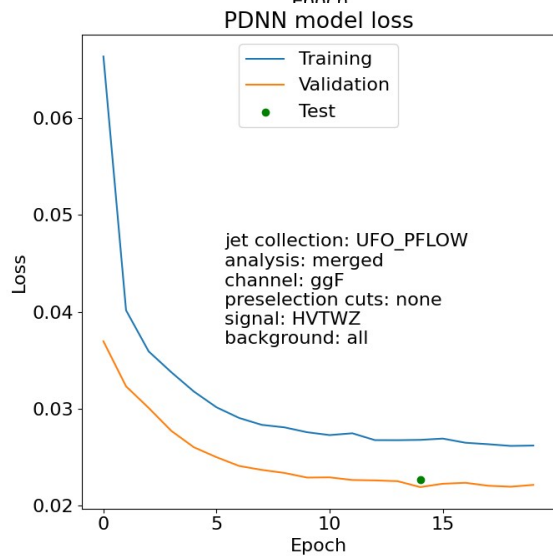
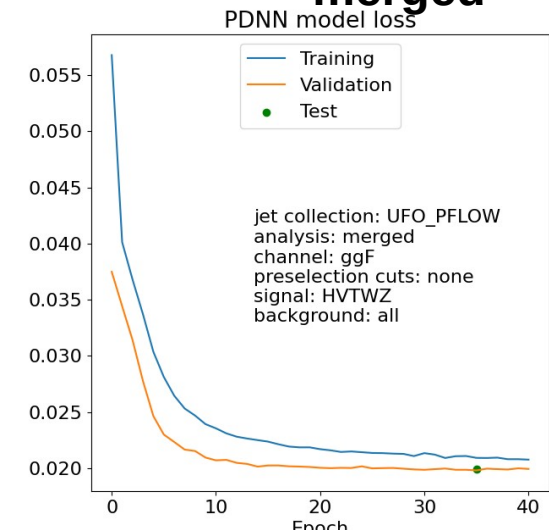
resolved



loose

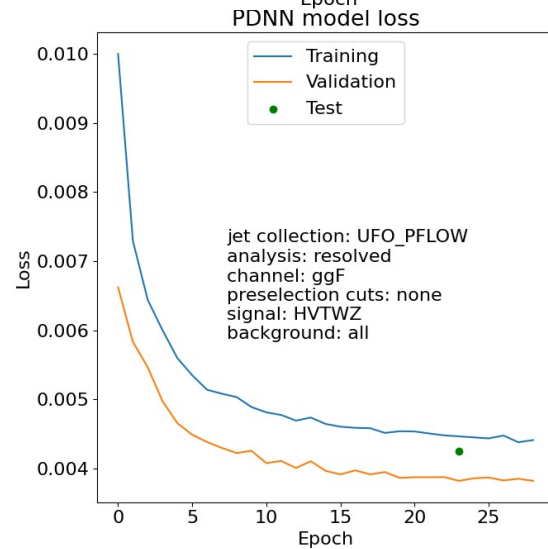
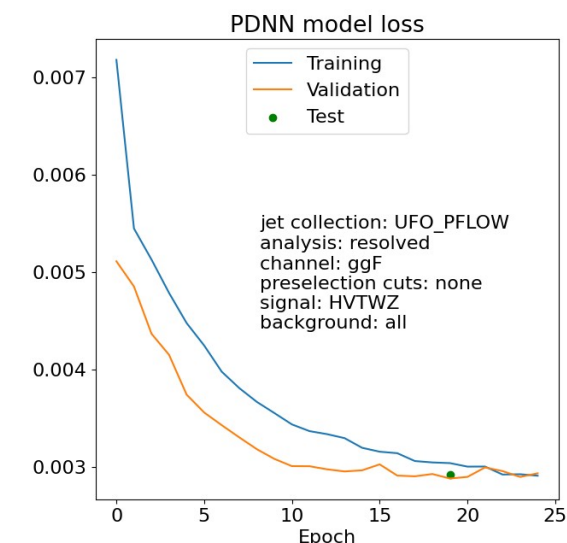


HVTWZ ggF merged



deep

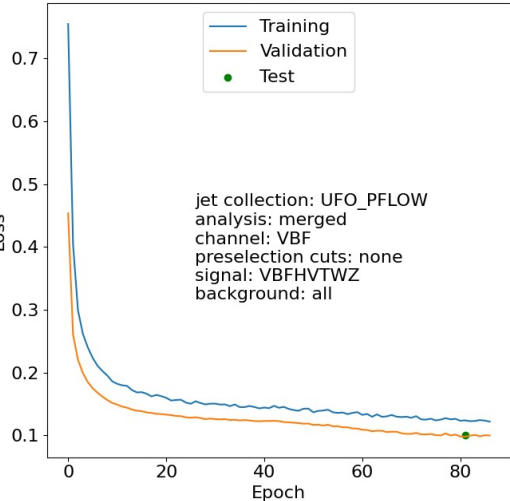
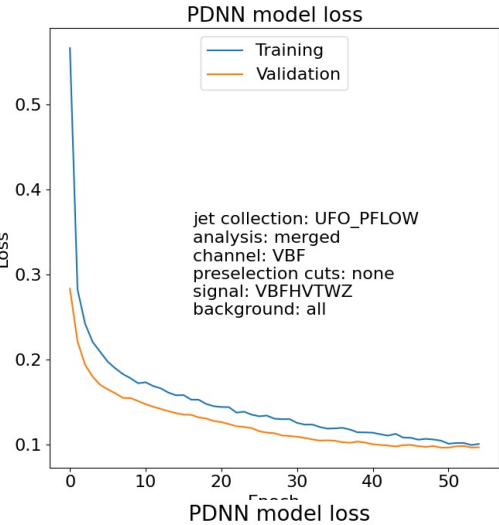
resolved



loose

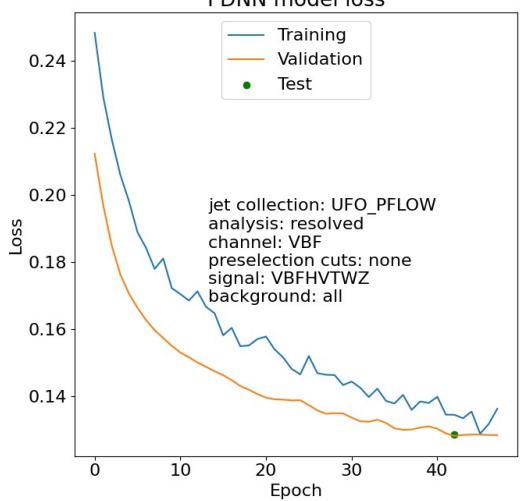
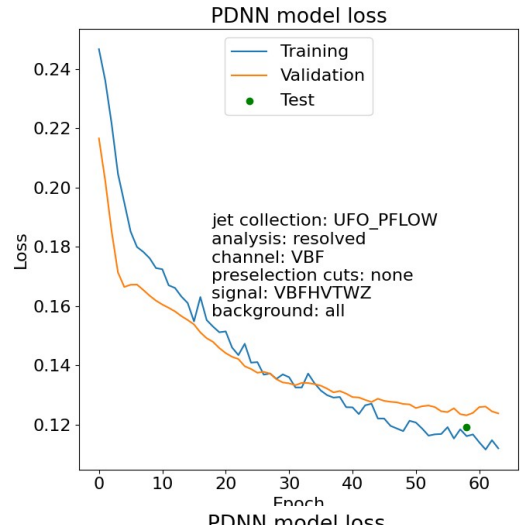
HVTWZ VBF

merged



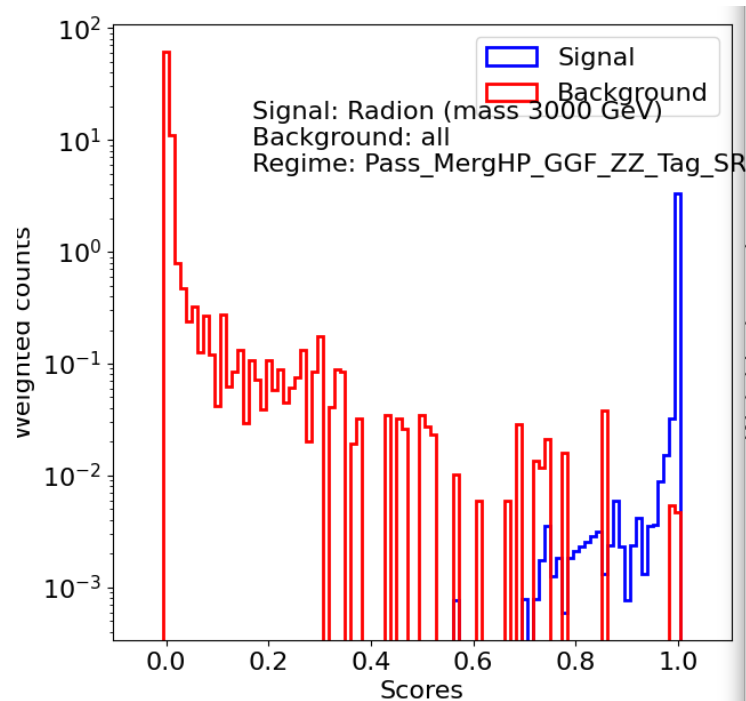
deep

resolved



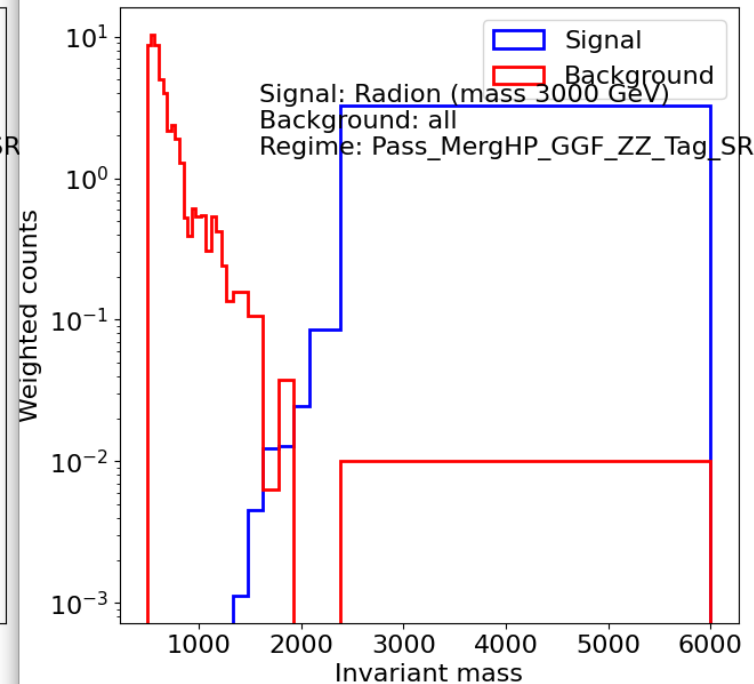
loose

Towards significance



↓

Molti bin vuoti, non è sbagliato pensare di usare anche 5/10 bin
Commento generale: poca statistica



↓

Dovremmo vedere il segnale piccato intorno alla massa selezionata? Se sì → cambiare bin

SIGNIFICANCE COMPARISON

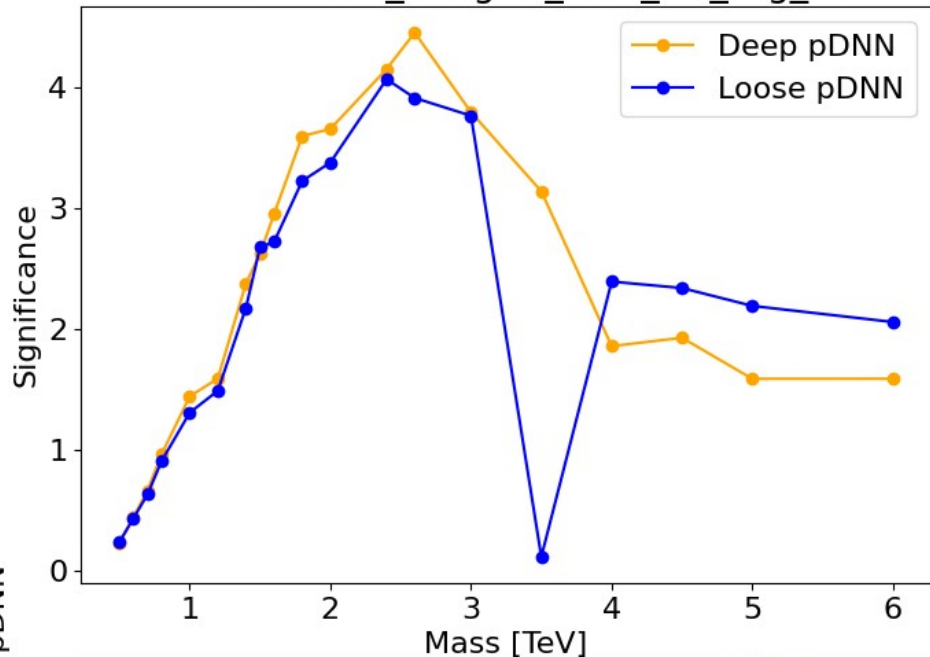
Plots in

/nfs/kloe/einstein4/HDBS/NNoutput/r33-22/UFO_PFLOW/none/deepPDNN/\$regime/

e.g.:

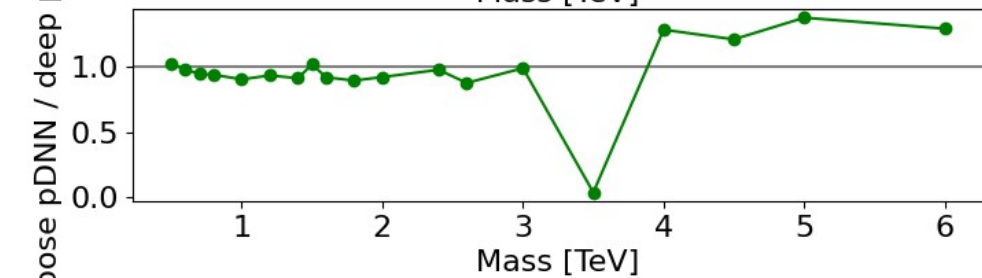
/nfs/kloe/einstein4/HDBS/NNoutput/r33-22/UFO_PFLOW/none/deepPDNN/
Pass_MergHP_GGF_ZZ_Untag_SR/significanceComparisonDeepVsLoose_r33-
22_UFO_PFLOW_none_RSG_all_Pass_MergHP_GGF_ZZ_Untag_SR.png

Radion, Pass_MergHP_GGF_ZZ_Tag_SR

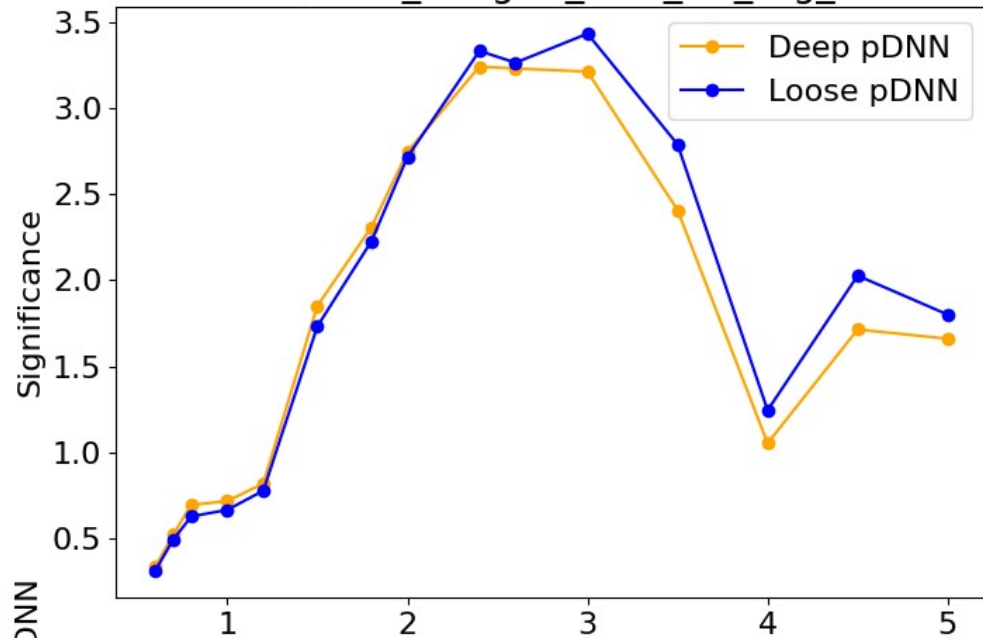


loose pDNN / deep pDNN

Mass [TeV]

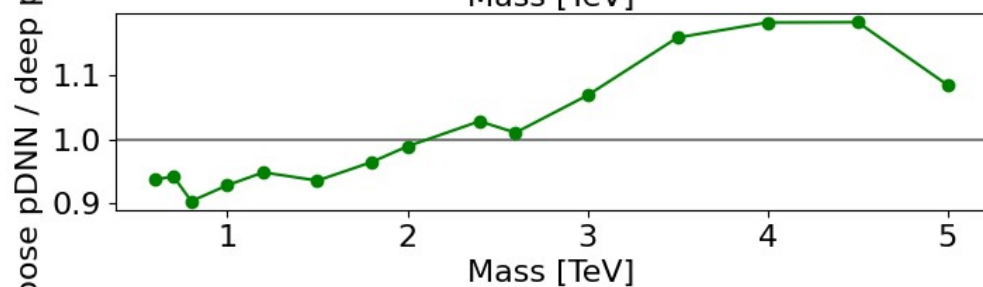


RSG, Pass_MergHP_GGF_ZZ_Tag_SR

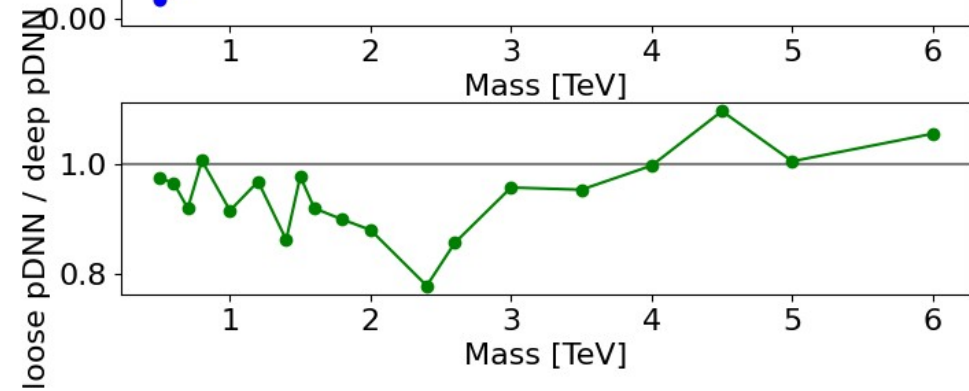
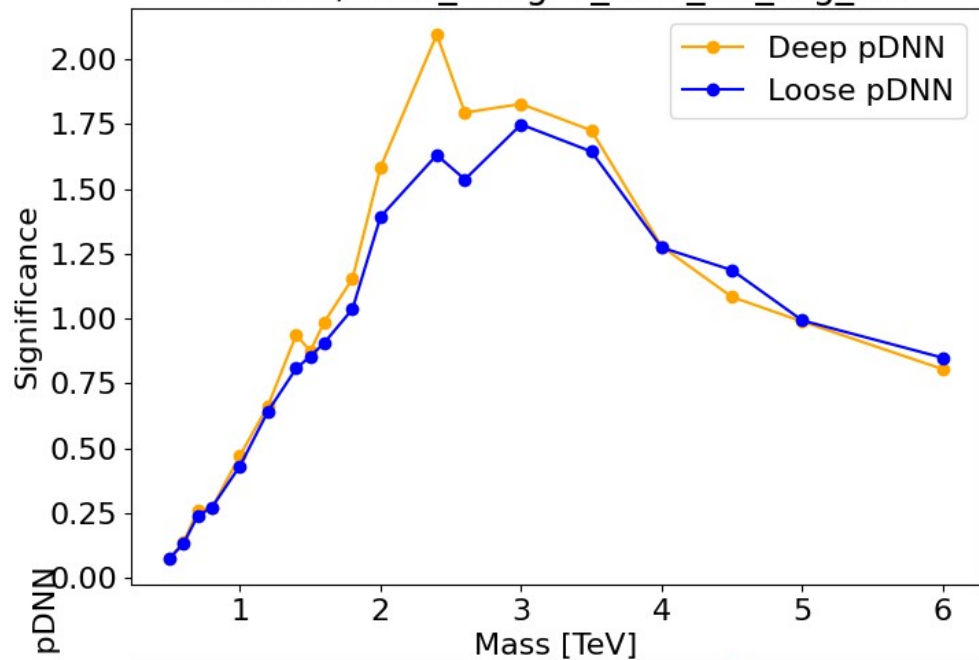


loose pDNN / deep pDNN

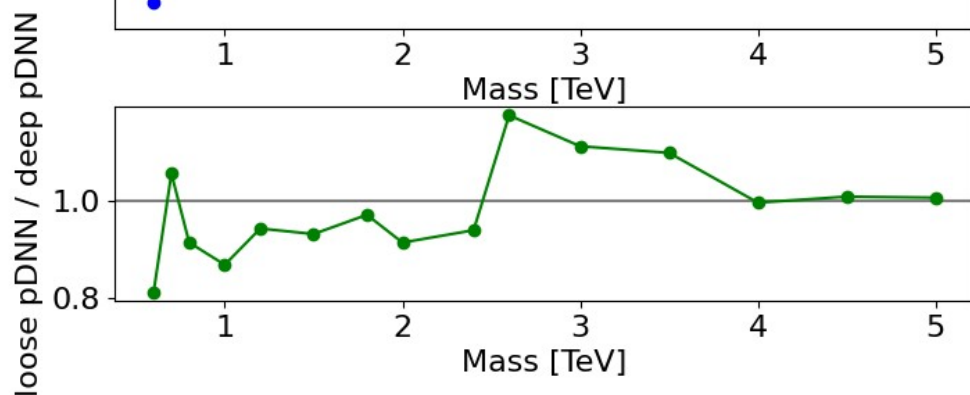
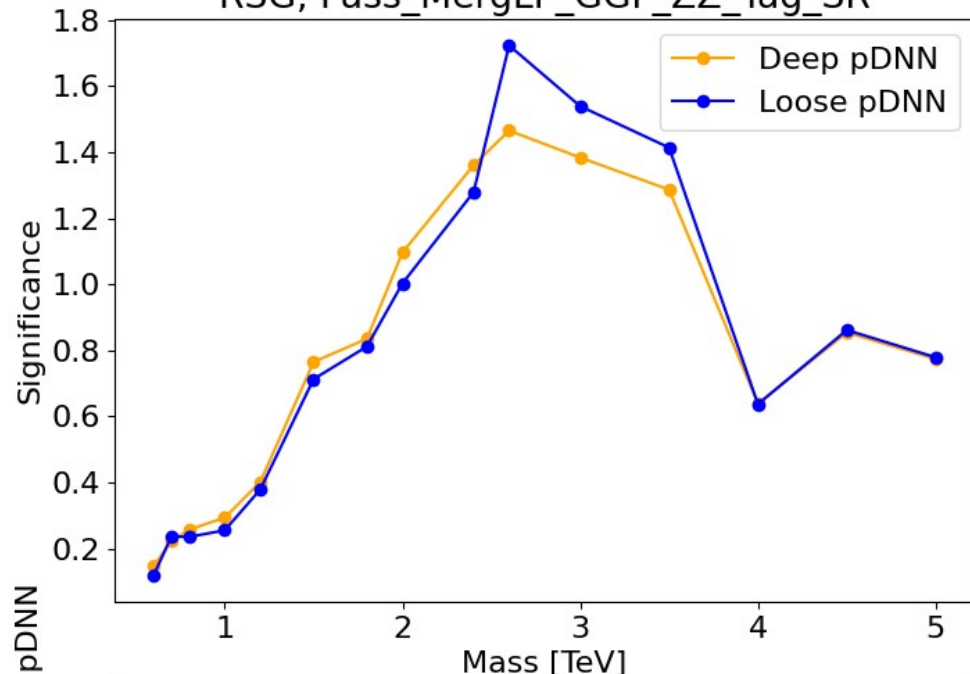
Mass [TeV]



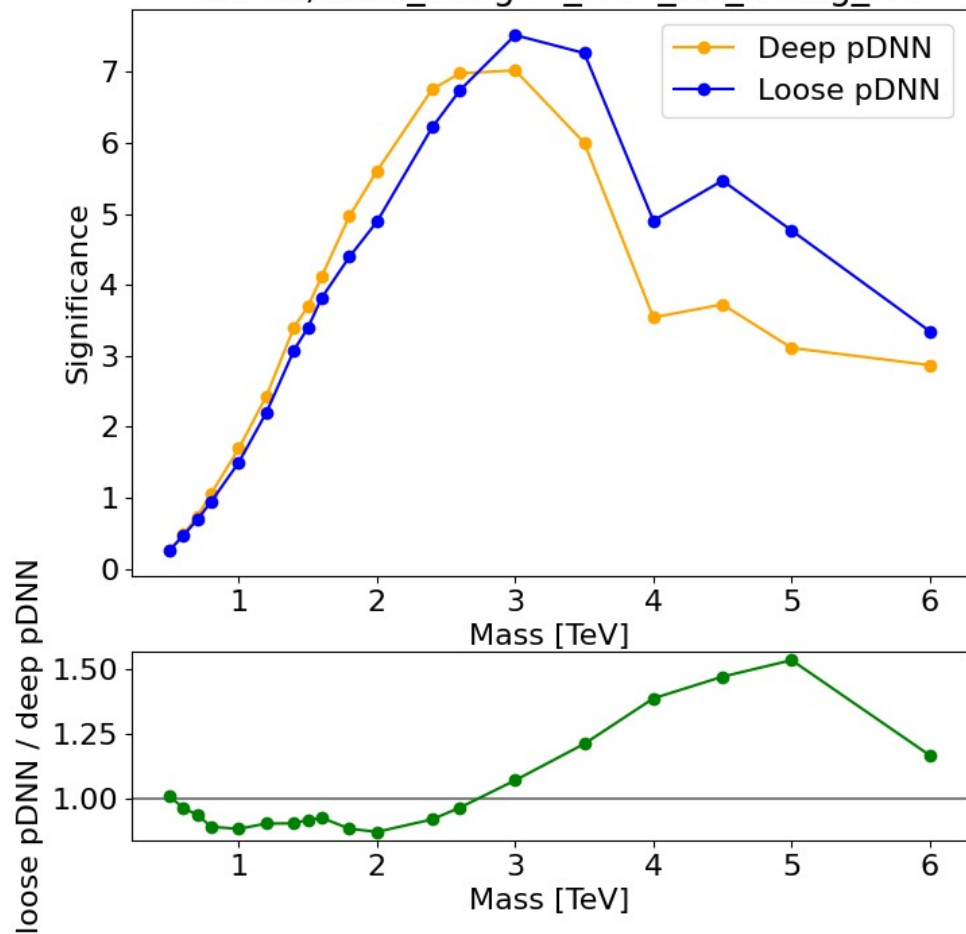
Radion, Pass_MergLP_GGF_ZZ_Tag_SR



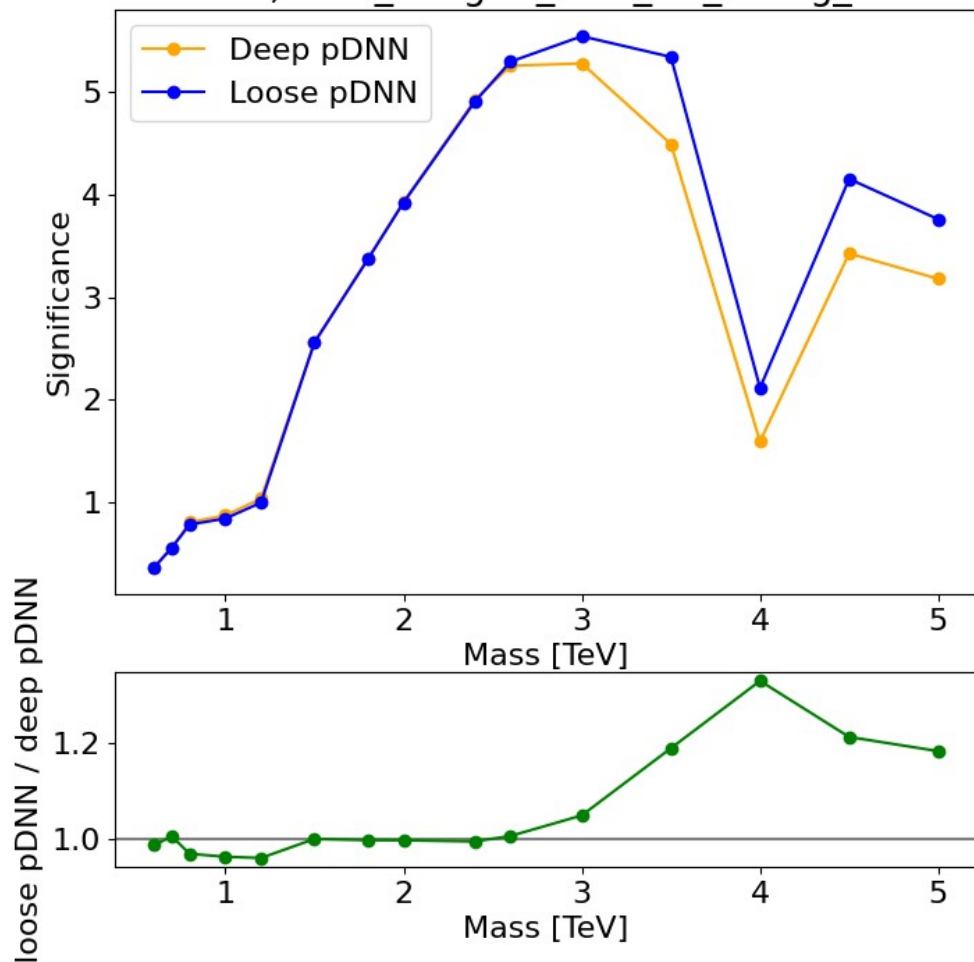
RSG, Pass_MergLP_GGF_ZZ_Tag_SR



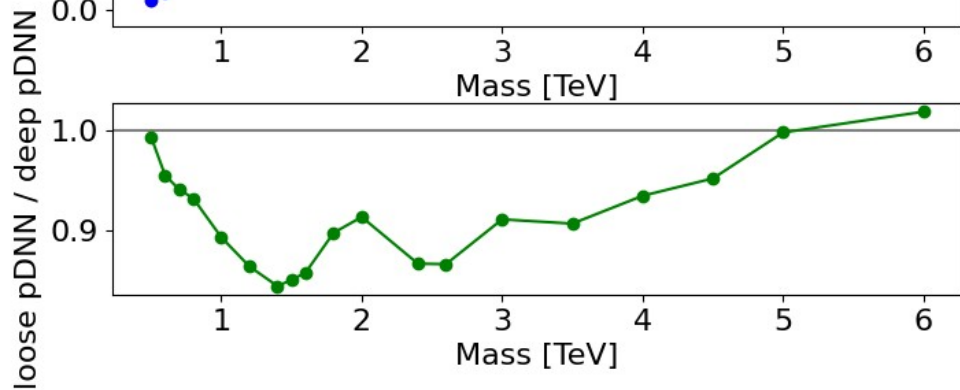
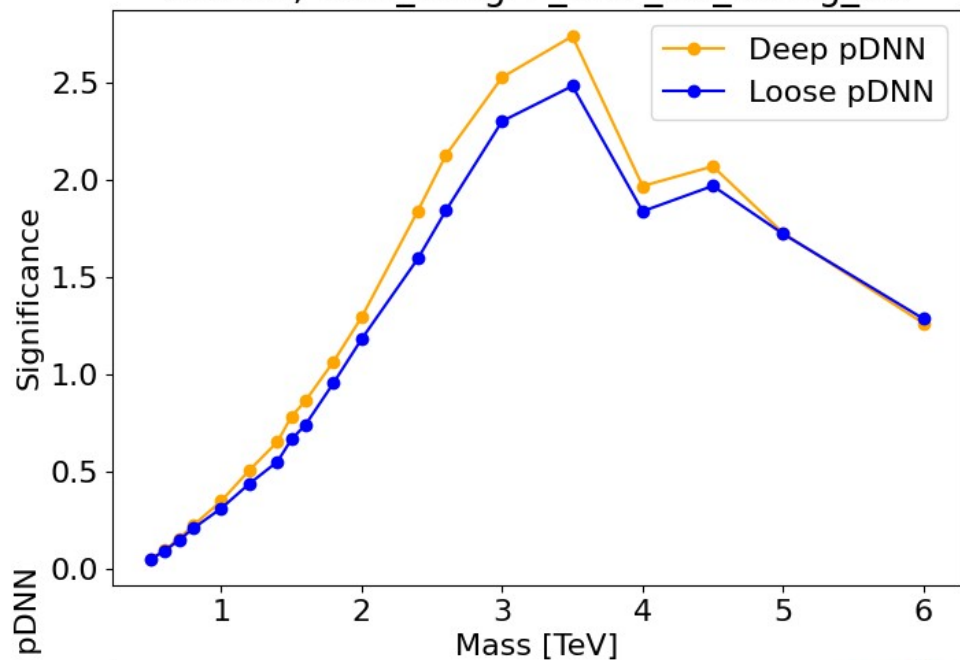
Radion, Pass_MergHP_GGF_ZZ_Untag_SR



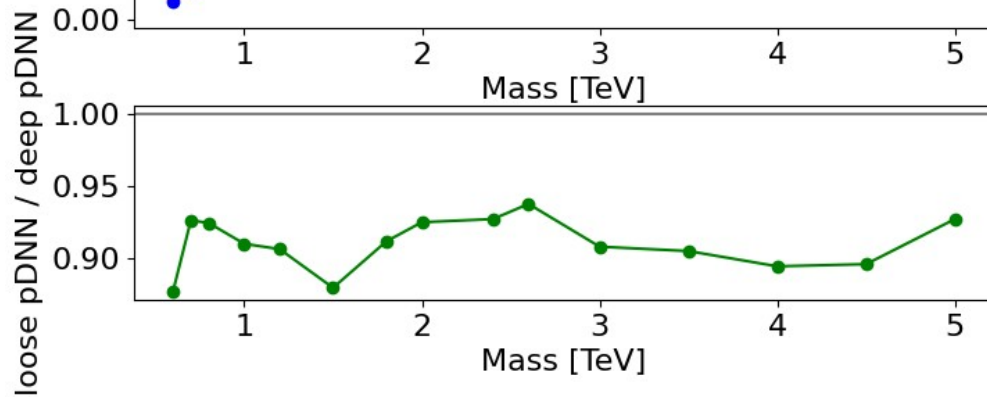
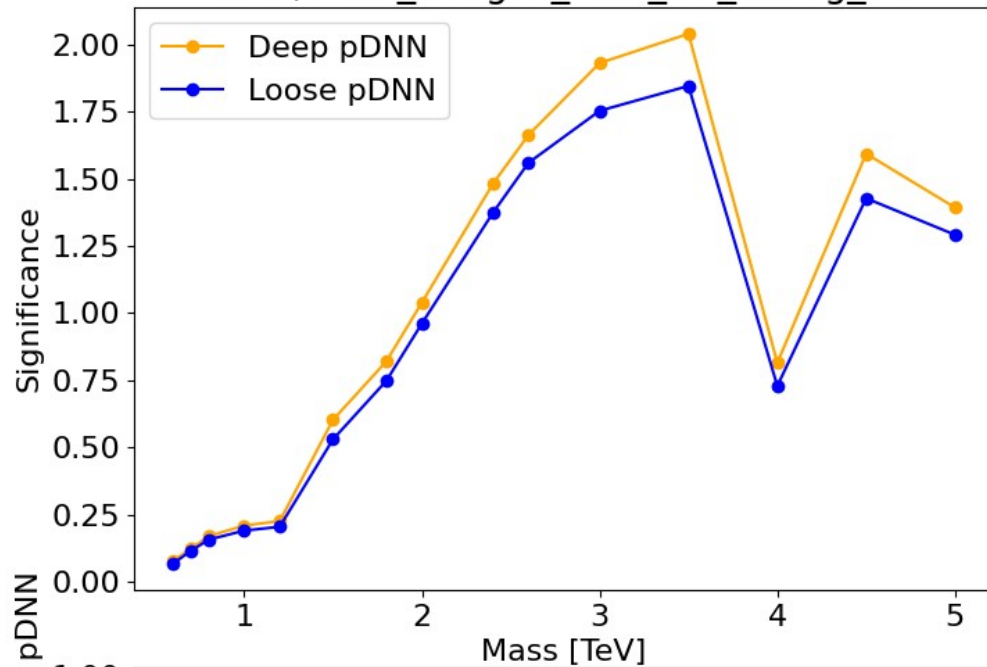
RSG, Pass_MergHP_GGF_ZZ_Untag_SR



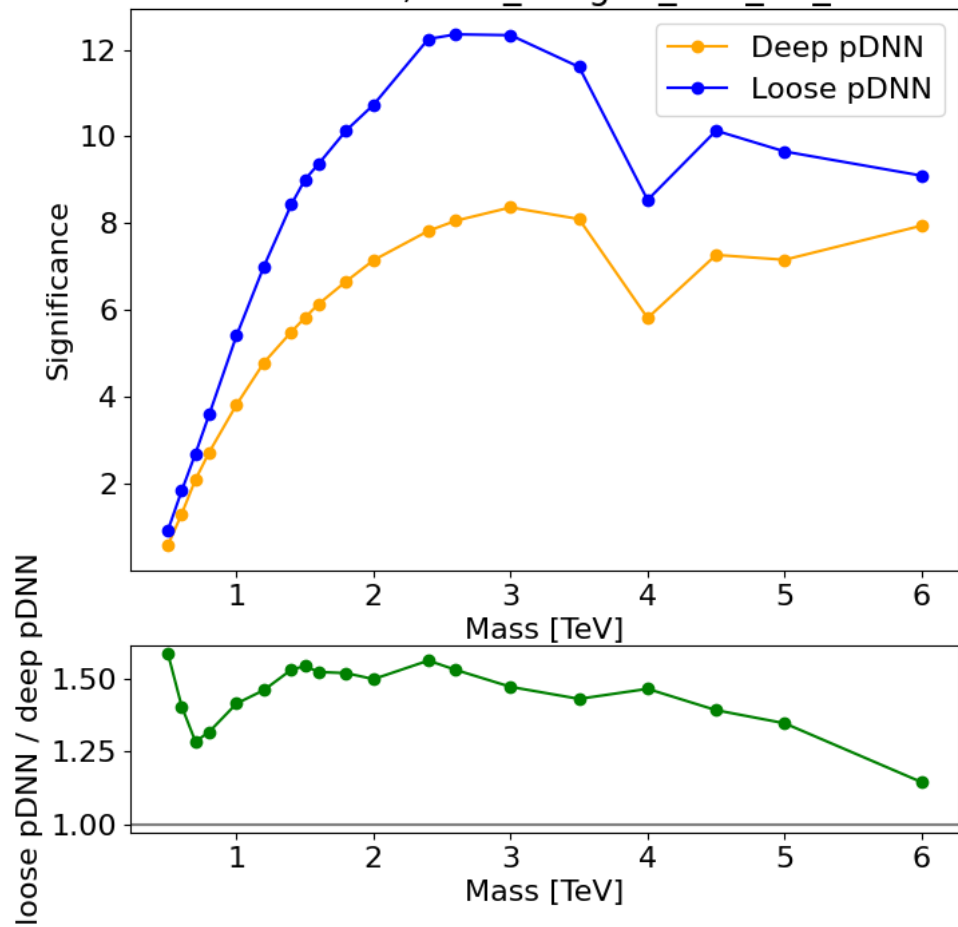
Radion, Pass_MergLP_GGF_ZZ_Untag_SR



RSG, Pass_MergLP_GGF_ZZ_Untag_SR

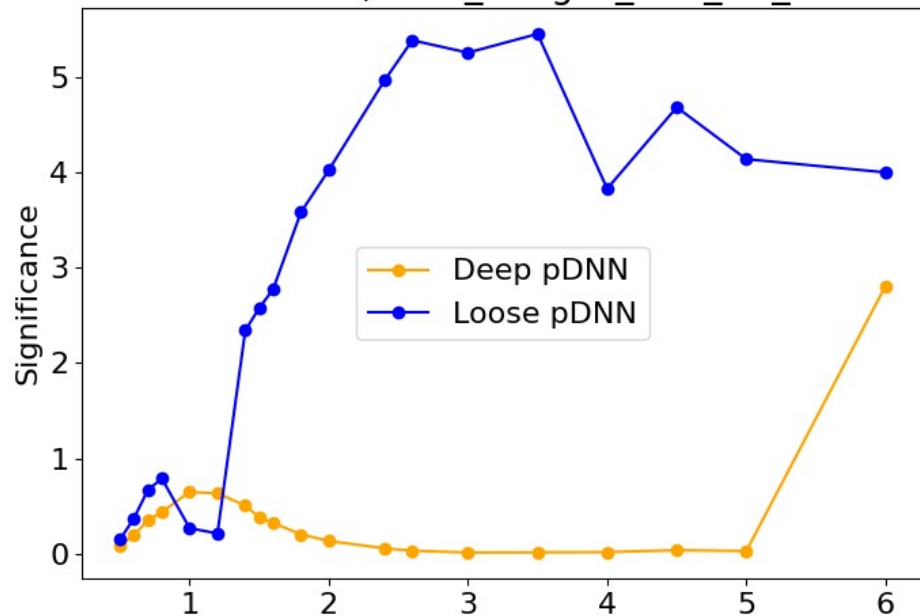


VBFRadion, Pass_MergHP_VBF_ZZ_SR

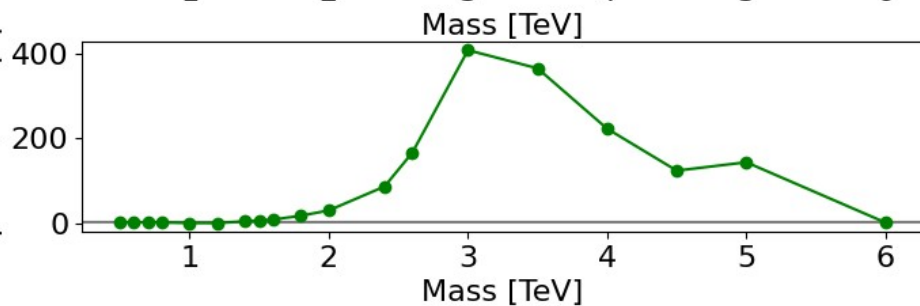


Division by 0

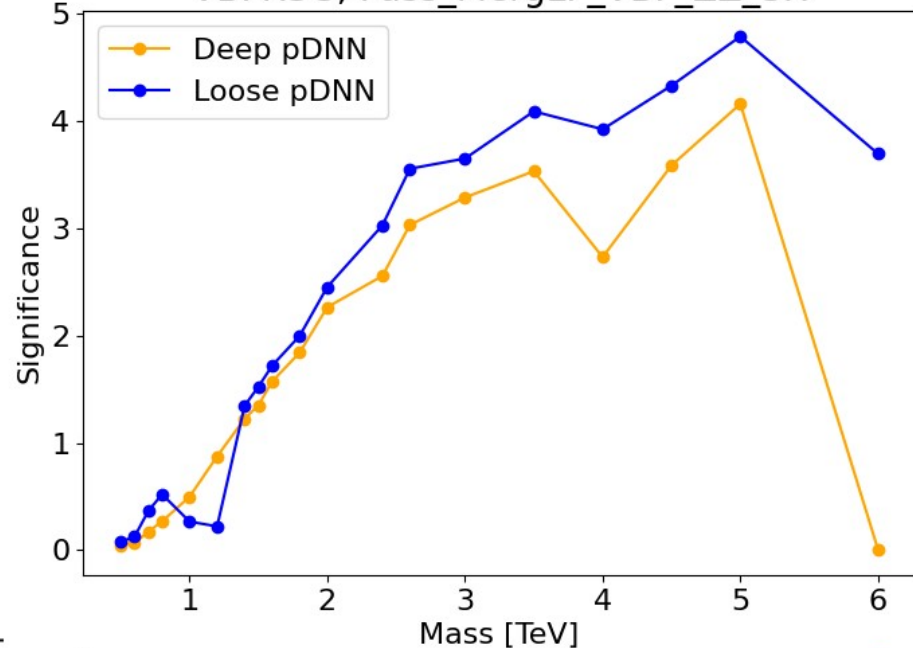
VBFRadion, Pass_MergLP_VBF_ZZ_SR



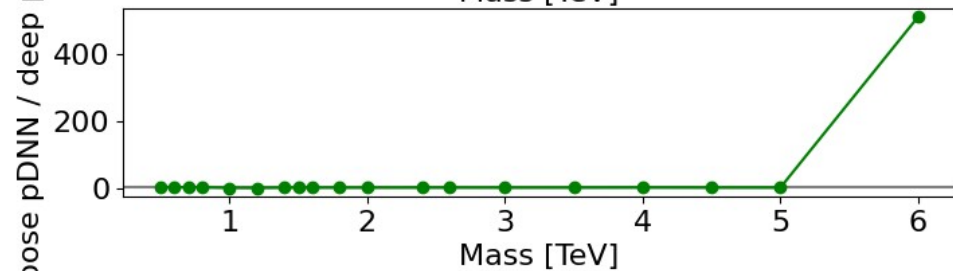
loose pDNN / deep pDNN



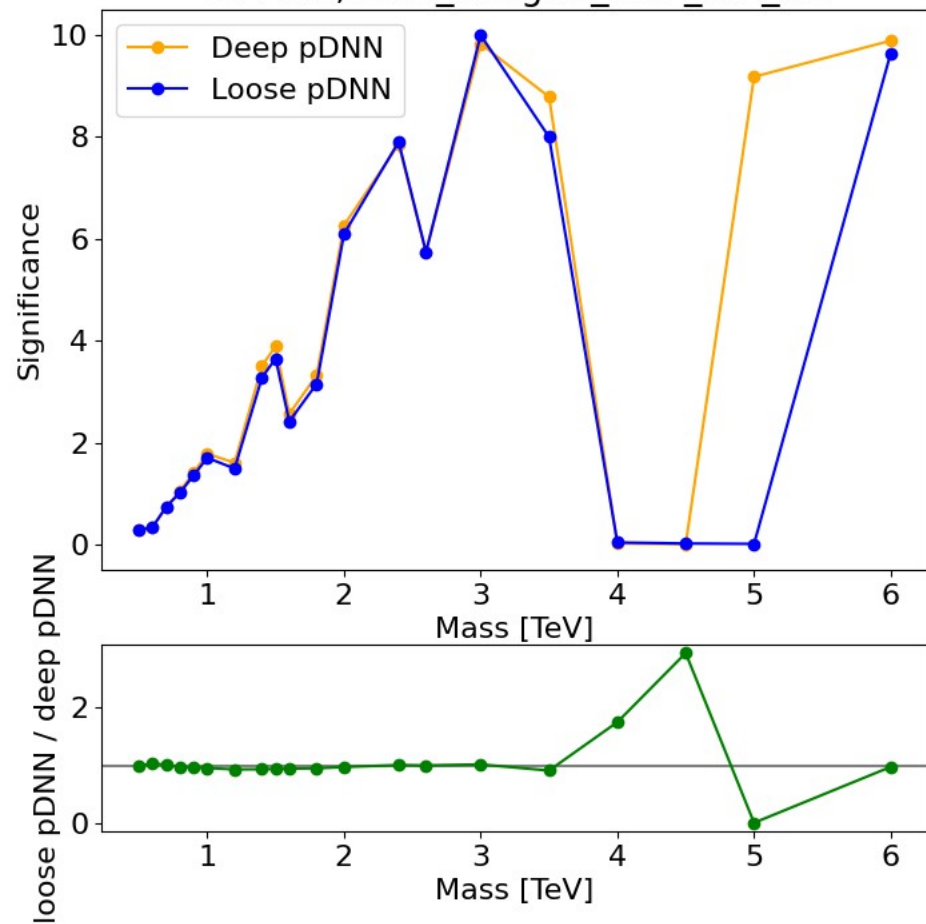
VBFRSG, Pass_MergLP_VBF_ZZ_SR



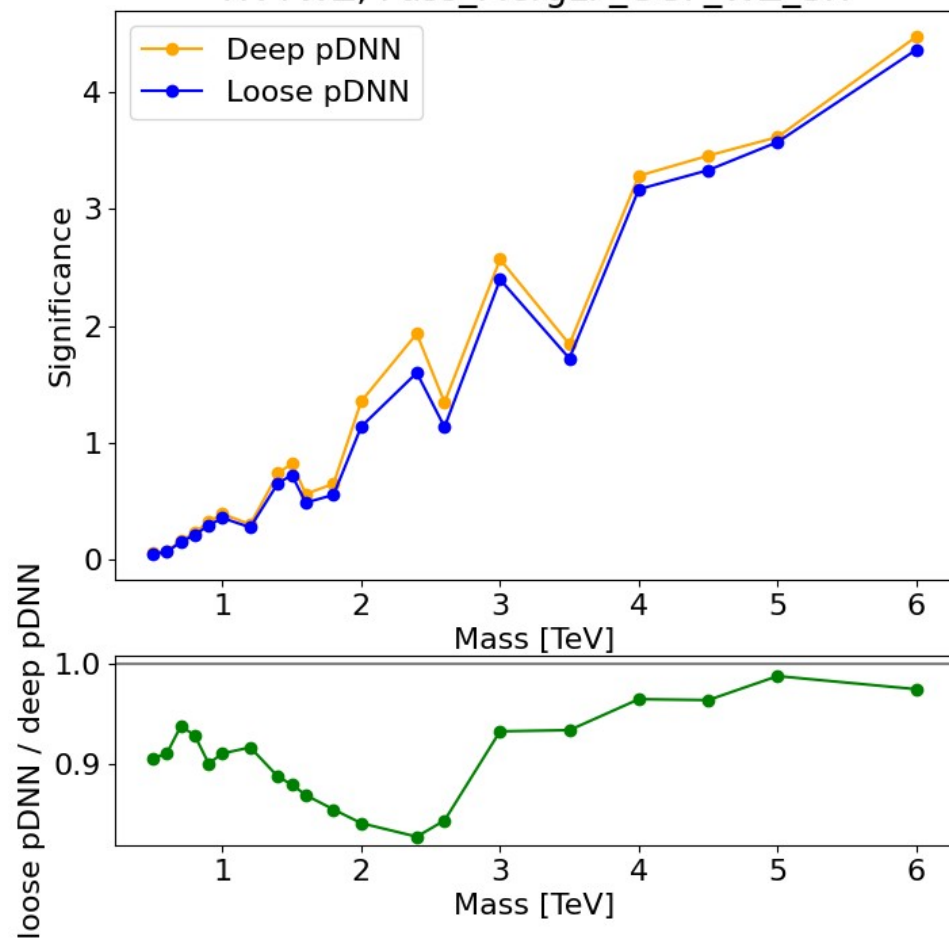
loose pDNN / deep pDNN



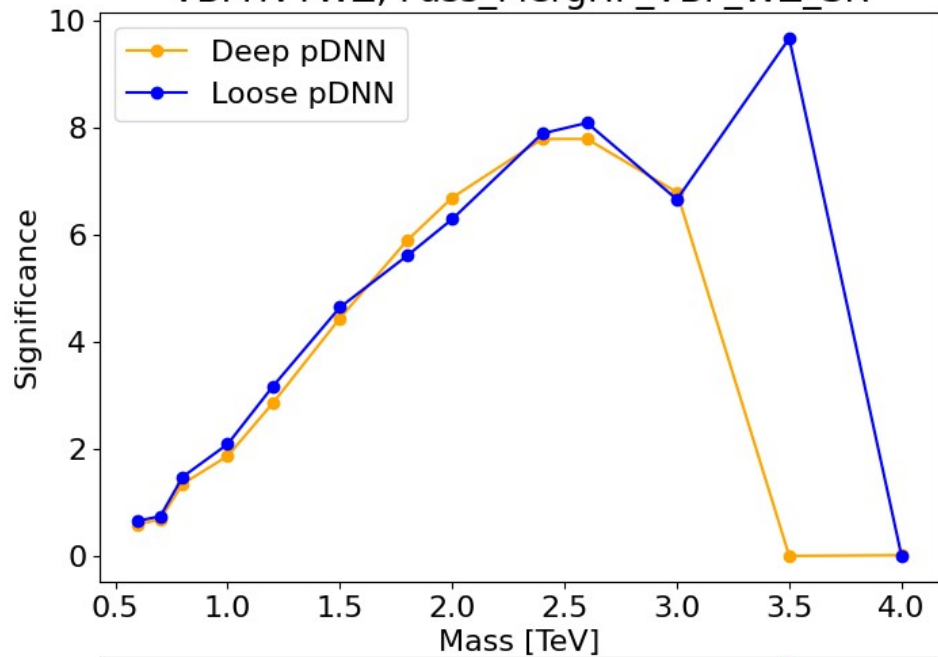
HVTWZ, Pass_MergHP_GGF_WZ_SR



HVTWZ, Pass_MergLP_GGF_WZ_SR



VBFHVTWZ, Pass_MergHP_VBF_WZ_SR



VBFHVTWZ, Pass_MergLP_VBF_WZ_SR

