Weekly Report

Xin Shuiting
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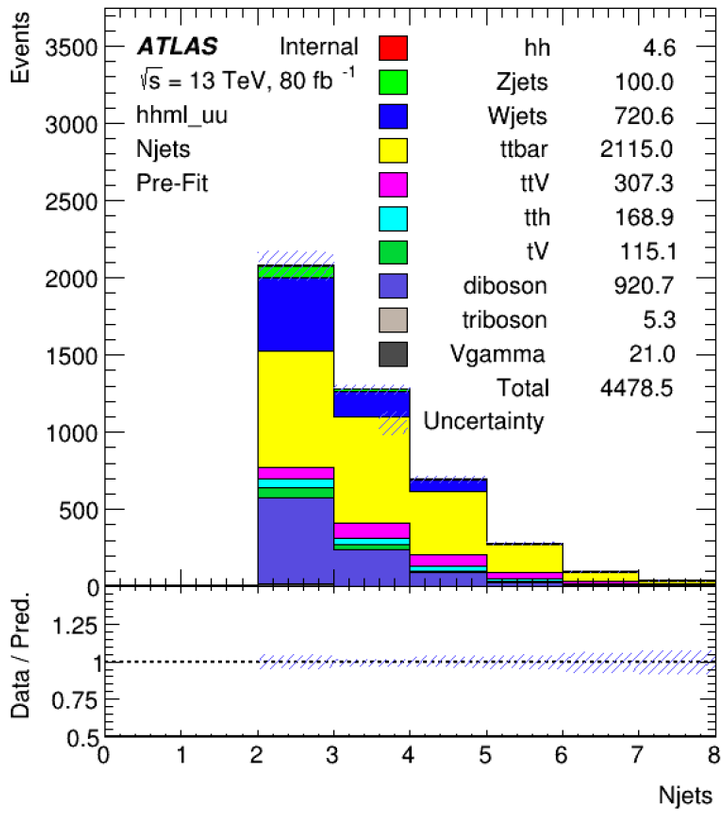
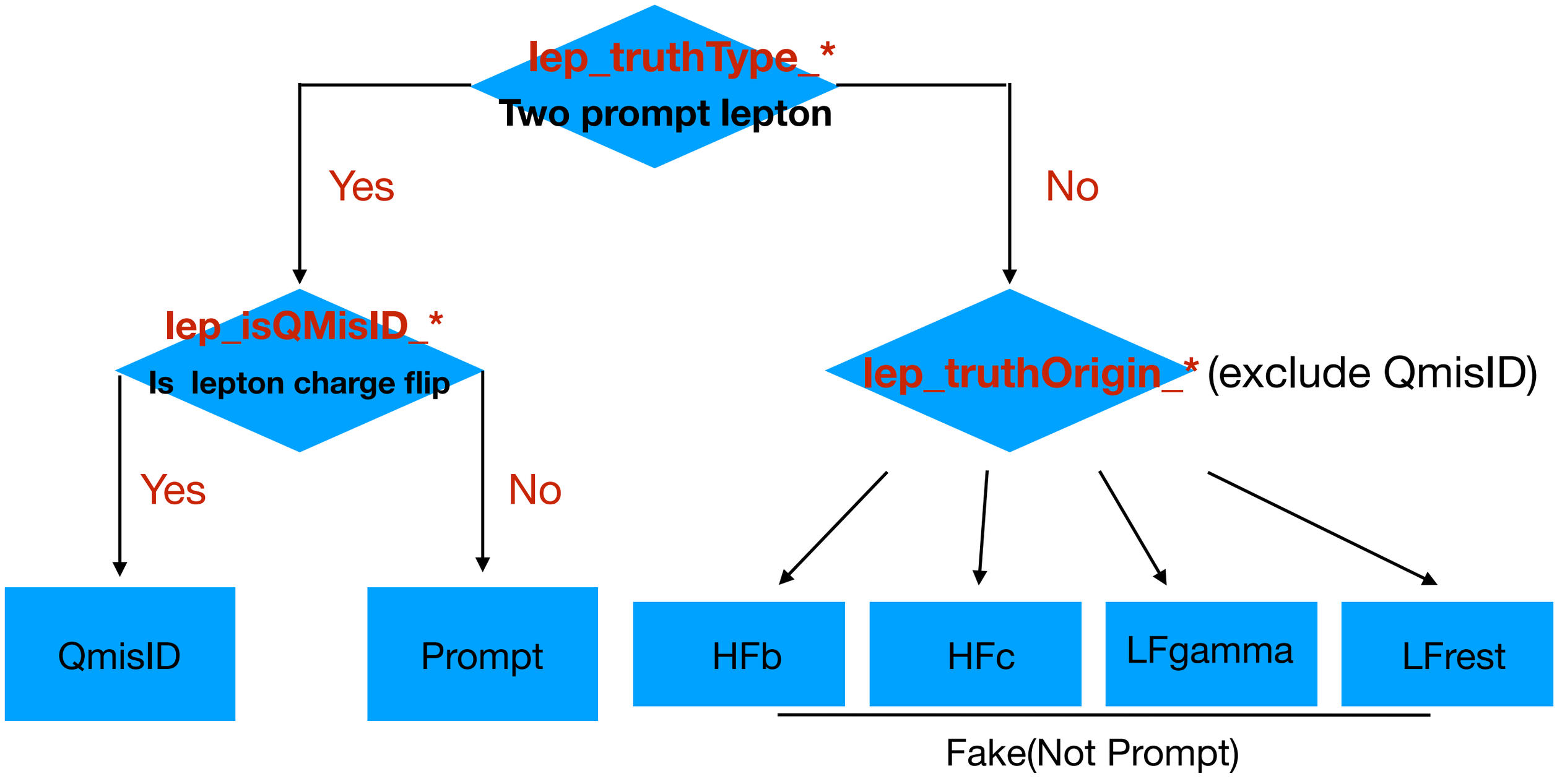
Contents

- Gird jobs, undergoing
- Pre-selection Plots update
    - Pointed out an mistake mc16a&e 80fb-1
    - Corrected tight lepton definition
    - Cut added.
- **Lepton origin derive from MC truth**



lepton type classification from gn2 samples

- Three variables: lep_truthType_*,lep_truthOrigin_*,lep_isQMisID_*
- Six class: prompt, QMisID, HFb, HFc,LFgamma, LFrest



Detail

- **Weight calculation**

```
weight = scale_nom*mcWeightOrg*pileupEventWeight_090*lepSFObjTight*lepSFTrigTight*JVT
_EventWeight*SherpaNJetWeight*MV2c10_70_EventWeight*(36074.6*(RunYear<2016.5)+43813.7
*(RunYear>2016.5))
scale_nom=mc_rawXSection*mc_kFactor/totalweights
```

- **Fake Origin**

HFb	BottomMeson, BBbarMeson, BottomBaryon
HFc	CharmedMeson, CCbarMeson, CharmBaryon
LFgamma	SinglePhot, PhotonConv, ElMagProc, DalitzDec, UndrPhot, BremPhot, ISRPhot
LFrest	LightMeson,LightBaryon,PionDecay,KaonDecay, TauLep, StrangeMeson, StrangeBaryon

Outputs in SS region

Zjets QmisID

Weight	Prompt	QmisID	HFb	HFc	LFgam	LFrest
ee	0	5033	180	28	808	1
uu	0	-1	280	60	0	49
eu	0	42	493	142	923	41

VV Prompt

Weight	Prompt	QmisID	HFb	HFc	LFgam	LFrest
ee	1199	93	9	1	35	0
uu	2026	0	12	6	0	2
eu	3081	70	21	6	34	1

ttbar Fake from HF

Weight	Prompt	QmisID	HFb	HFc	LFgam	LFrest
ee	26	1170	2668	91	389	28
uu	32	0.22	3096	209	0	61
eu	57	1405	5758	298	478	85

Wjets Fake from HF

Weight	Prompt	QmisID	HFb	HFc	LFgam	LFrest
ee	0	0	1229	137	389	-15
uu	0	0	1524	671	0	683
eu	0	0	434	434	2027	179

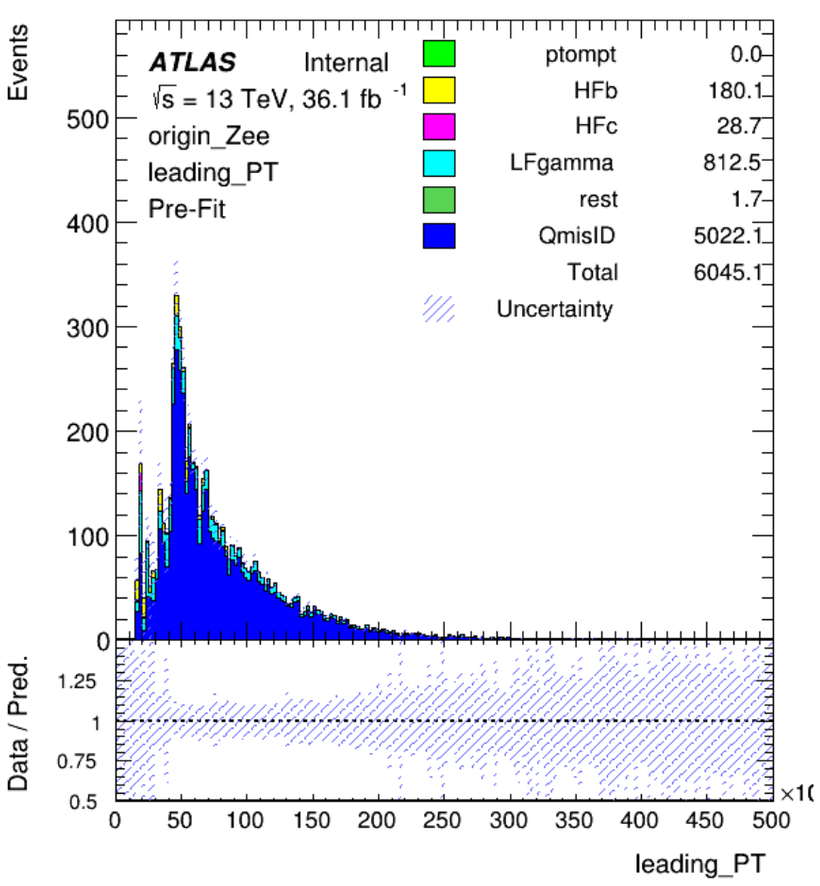
Conclusion

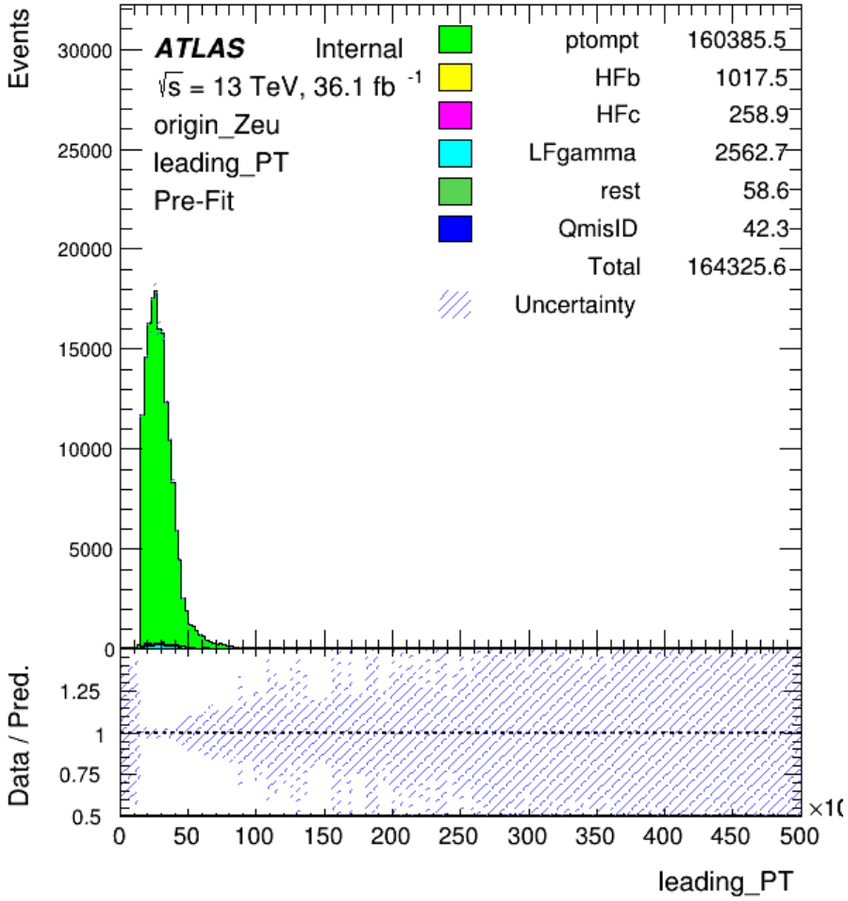
- many information can be obtained from lepton origin analysis
  - Leading contribution from fakes :ttbar, Wjets (heavy b decay)
    QMisID: Zjets,ttbar
    Prompt: diboson …
  - …

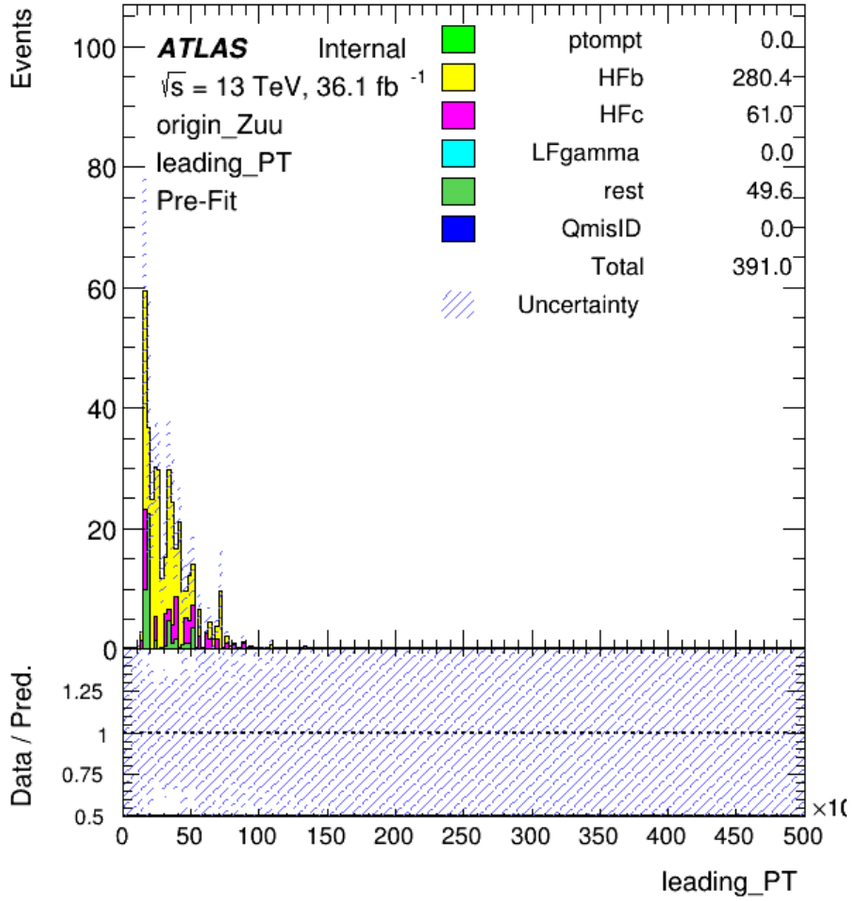
Add more backgrounds if necessary, tth, ttv…

Backup

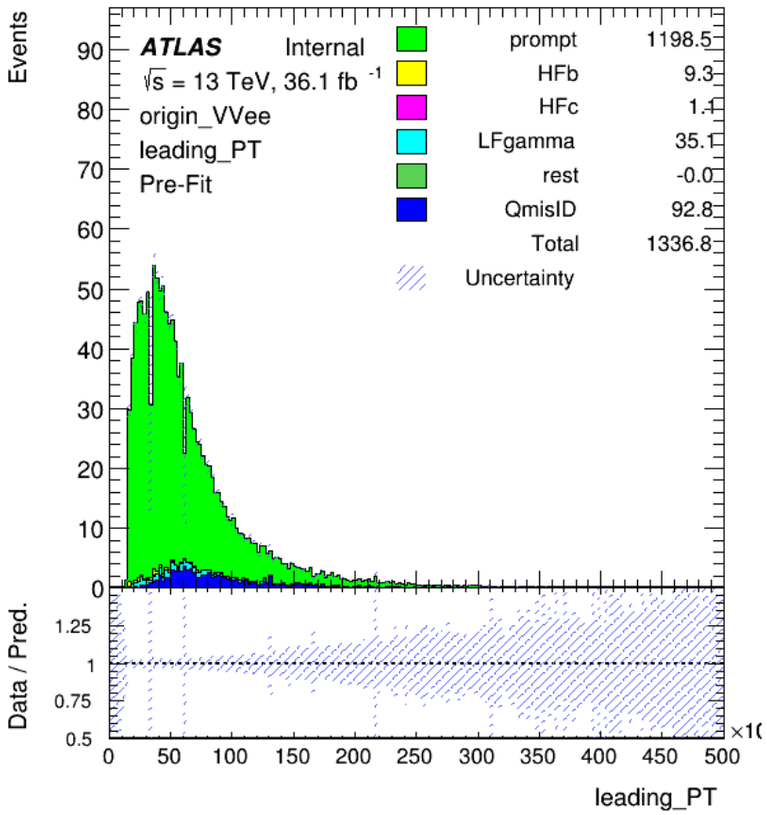
Zjets

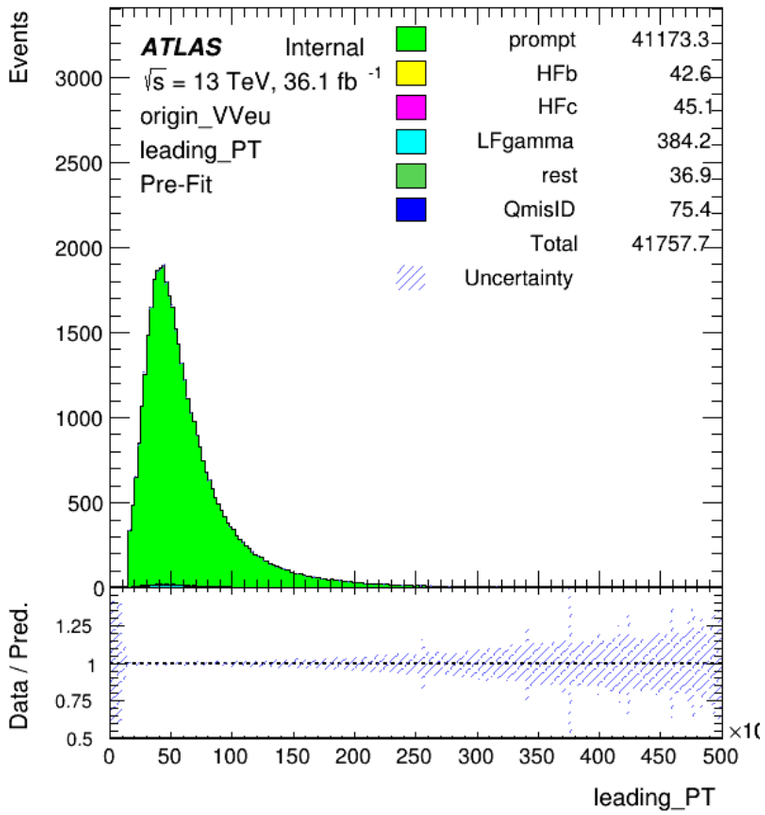

ATLAS Internal
√s = 13 TeV, 36.1 fb -1
origin_Zee
leading_PT
Pre-Fit
ptompt 0.0
HFb 180.1
HFc 28.7
LFgamma 812.5
rest 1.7
QmisID 5022.1
Total 6045.1
Uncertainty
Events
Data / Pred.
leading_PT

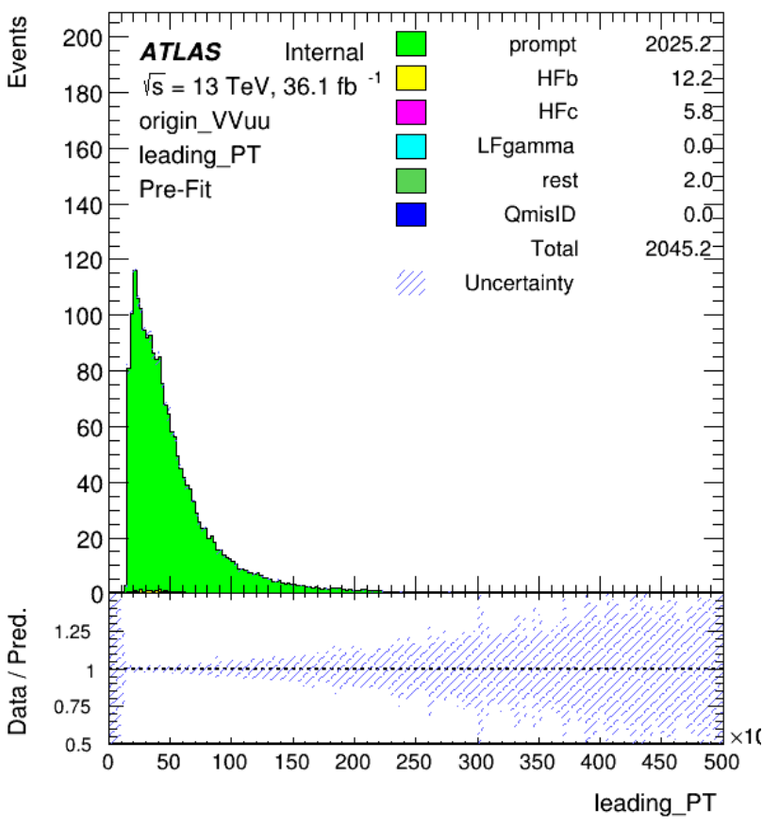

ATLAS Internal
√s = 13 TeV, 36.1 fb -1
origin_Zeu
leading_PT
Pre-Fit
ptompt 160385.5
HFb 1017.5
HFc 258.9
LFgamma 2562.7
rest 58.6
QmisID 42.3
Total 164325.6
Uncertainty
Events
Data / Pred.
leading_PT


ATLAS Internal
√s = 13 TeV, 36.1 fb -1
origin_Zuu
leading_PT
Pre-Fit
ptompt 0.0
HFb 280.4
HFc 61.0
LFgamma 0.0
rest 49.6
QmisID 0.0
Total 391.0
Uncertainty
Events
Data / Pred.
leading_PT

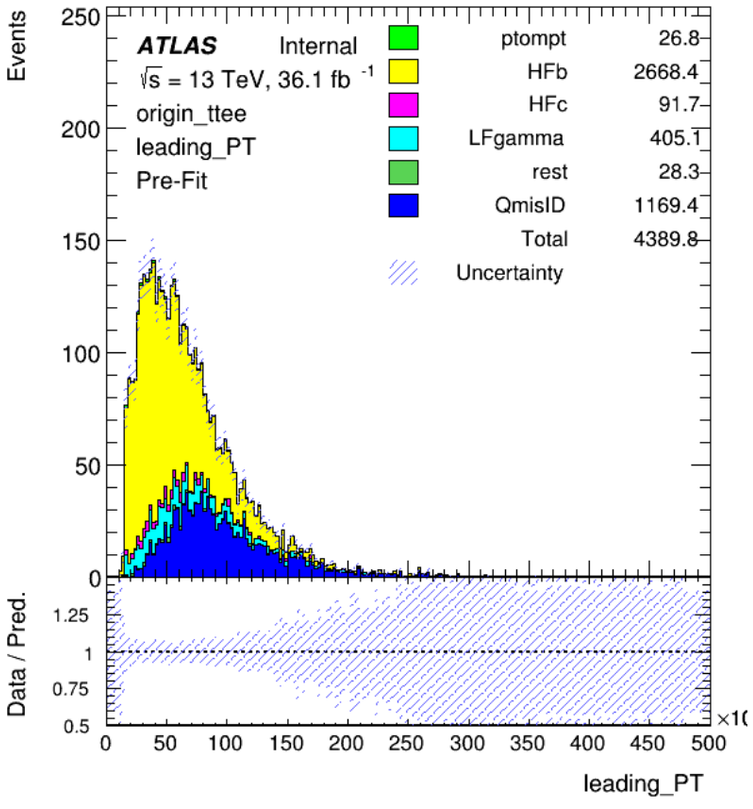
VV

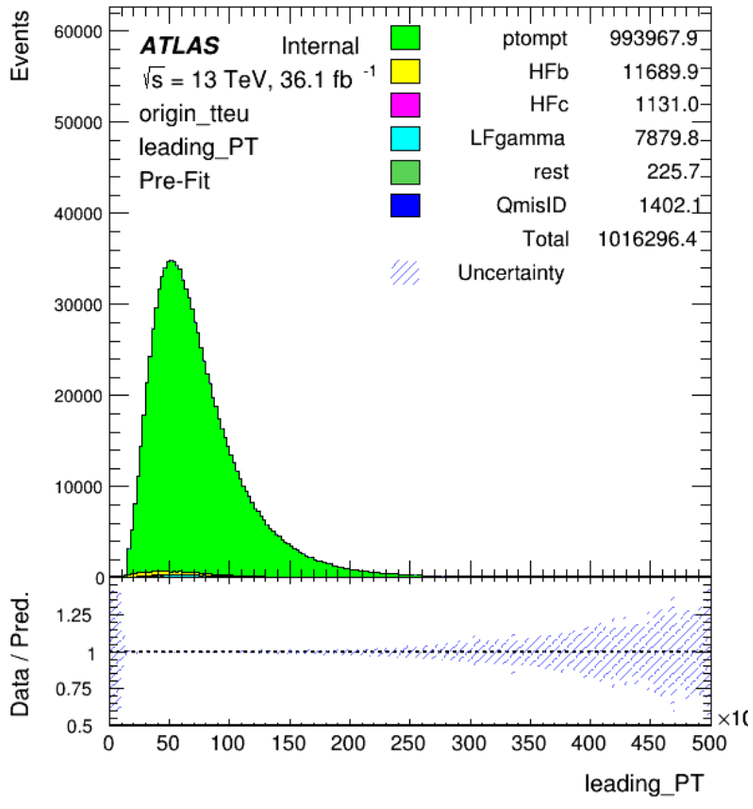

ATLAS Internal
√s = 13 TeV, 36.1 fb -1
origin_VVee
leading_PT
Pre-Fit
prompt 1198.5
HFb 9.3
HFc 1.1
LFgamma 35.1
rest -0.0
QmisID 92.8
Total 1336.8
Uncertainty
Events
Data / Pred.
leading_PT

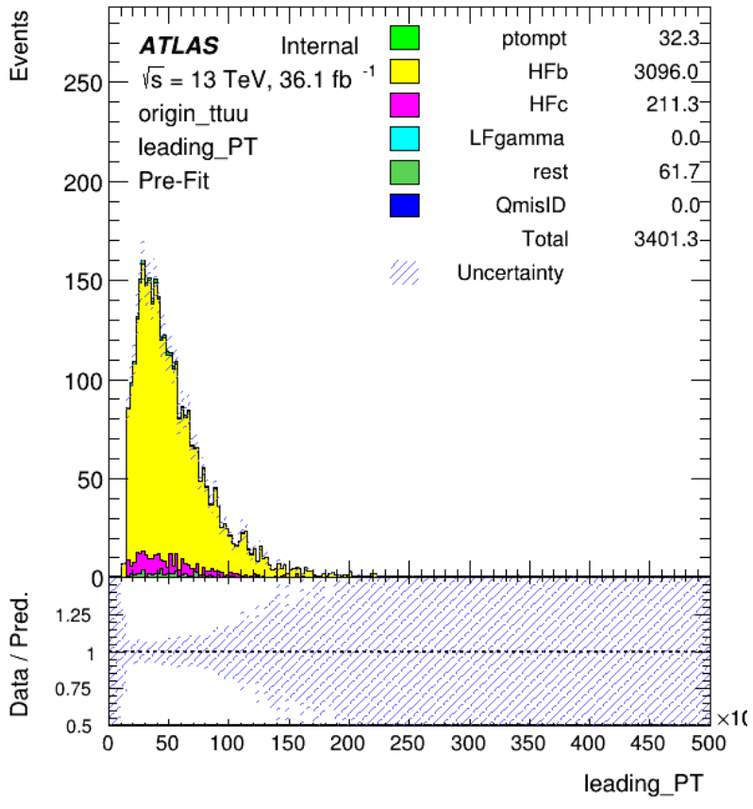

ATLAS Internal
√s = 13 TeV, 36.1 fb -1
origin_VVeu
leading_PT
Pre-Fit
prompt 41173.3
HFb 42.6
HFc 45.1
LFgamma 384.2
rest 36.9
QmisID 75.4
Total 41757.7
Uncertainty
Events
Data / Pred.
leading_PT


ATLAS Internal
√s = 13 TeV, 36.1 fb -1
origin_VVuu
leading_PT
Pre-Fit
prompt 2025.2
HFb 12.2
HFc 5.8
LFgamma 0.0
rest 2.0
QmisID 0.0
Total 2045.2
Uncertainty
Events
Data / Pred.
leading_PT

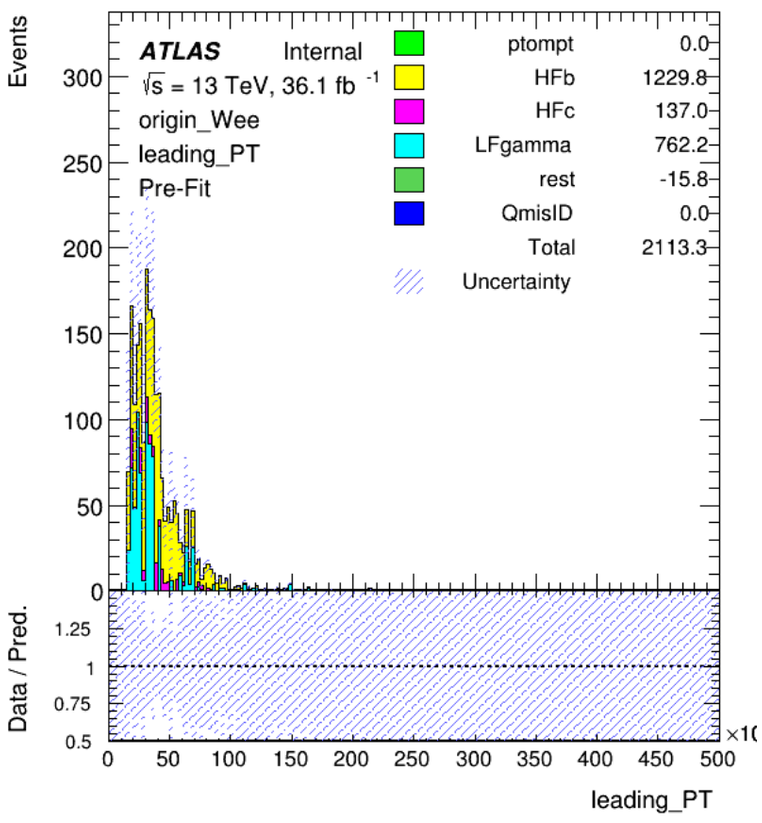
Ttbar

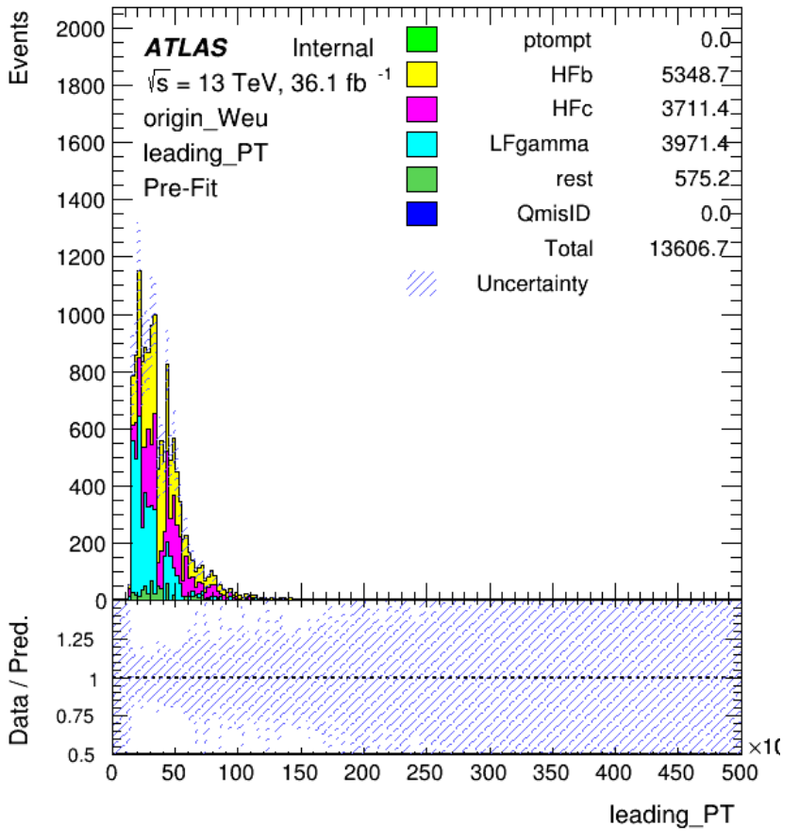

ATLAS Internal
√s = 13 TeV, 36.1 fb -1
origin_ttee
leading_PT
Pre-Fit
ptompt 26.8
HFb 2668.4
HFc 91.7
LFgamma 405.1
rest 28.3
QmisID 1169.4
Total 4389.8
Uncertainty
Events
Data / Pred.
leading_PT

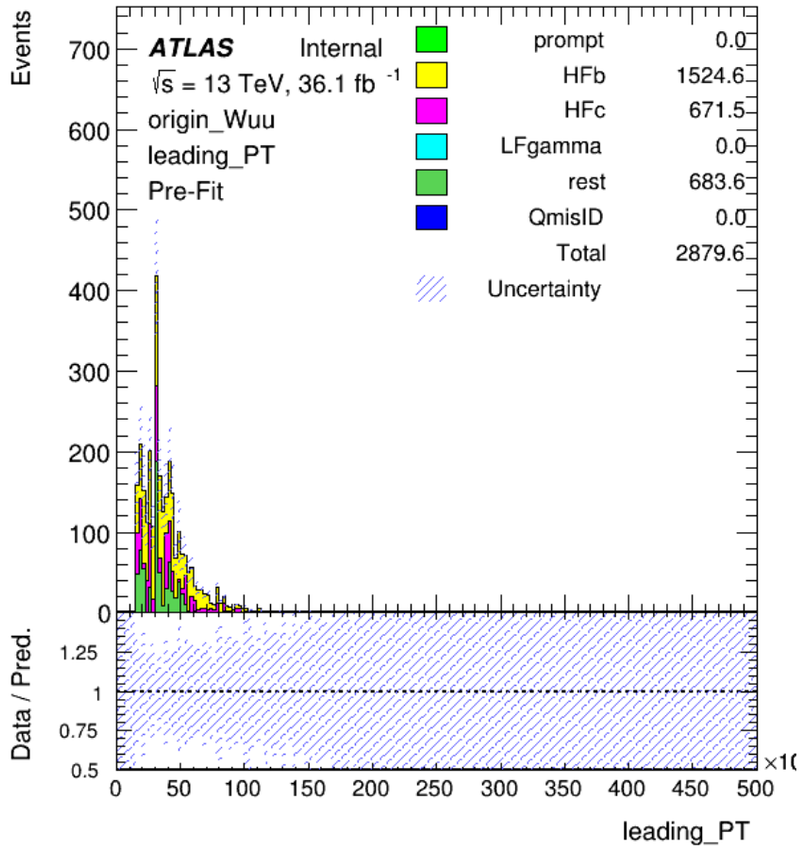

ATLAS Internal
√s = 13 TeV, 36.1 fb -1
origin_tteu
leading_PT
Pre-Fit
ptompt 993967.9
HFb 11689.9
HFc 1131.0
LFgamma 7879.8
rest 225.7
QmisID 1402.1
Total 1016296.4
Uncertainty
Events
Data / Pred.
leading_PT


ATLAS Internal
√s = 13 TeV, 36.1 fb -1
origin_ttuu
leading_PT
Pre-Fit
ptompt 32.3
HFb 3096.0
HFc 211.3
LFgamma 0.0
rest 61.7
QmisID 0.0
Total 3401.3
Uncertainty
Events
Data / Pred.
leading_PT

Wjets


ATLAS Internal
√s = 13 TeV, 36.1 fb -1
origin_Wee
leading_PT
Pre-Fit
ptompt 0.0
HFb 1229.8
HFc 137.0
LFgamma 762.2
rest -15.8
QmisID 0.0
Total 2113.3
Uncertainty
Events
Data / Pred.
leading_PT


ATLAS Internal
√s = 13 TeV, 36.1 fb -1
origin_Weu
leading_PT
Pre-Fit
ptompt 0.0
HFb 5348.7
HFc 3711.4
LFgamma 3971.4
rest 575.2
QmisID 0.0
Total 13606.7
Uncertainty
Events
Data / Pred.
leading_PT


ATLAS Internal
√s = 13 TeV, 36.1 fb -1
origin_Wuu
leading_PT
Pre-Fit
prompt 0.0
HFb 1524.6
HFc 671.5
LFgamma 0.0
rest 683.6
QmisID 0.0
Total 2879.6
Uncertainty
Events
Data / Pred.
leading_PT