Data vs MC in 2018

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Data and cuts

- 2018 data with 59.69 fb^{-1} (Golden JSON)
- Recommended triggers for MuonEG, SingleMuon, DoubleMuon, EGamma
  - and some additional triggers for MuonEG
- Recommended MET filters applied
- Electron and muon scale factors applied
- Now with systematics

- Electron ID: Isolation WP90
- Muon ID: Cut-based medium, loose iso
- Exactly two opposite sign same flavor leptons
- Leading lepton $p_T > 25$ GeV, Subleading > 20 GeV
- $M_{ll} > 20$ GeV
- Z window cut (from 76 GeV to 106 GeV)
- At least 2 jets
- Jet $p_T > 30$ GeV
- b-tag an MET cuts ignored

Systematic uncertainties

Included

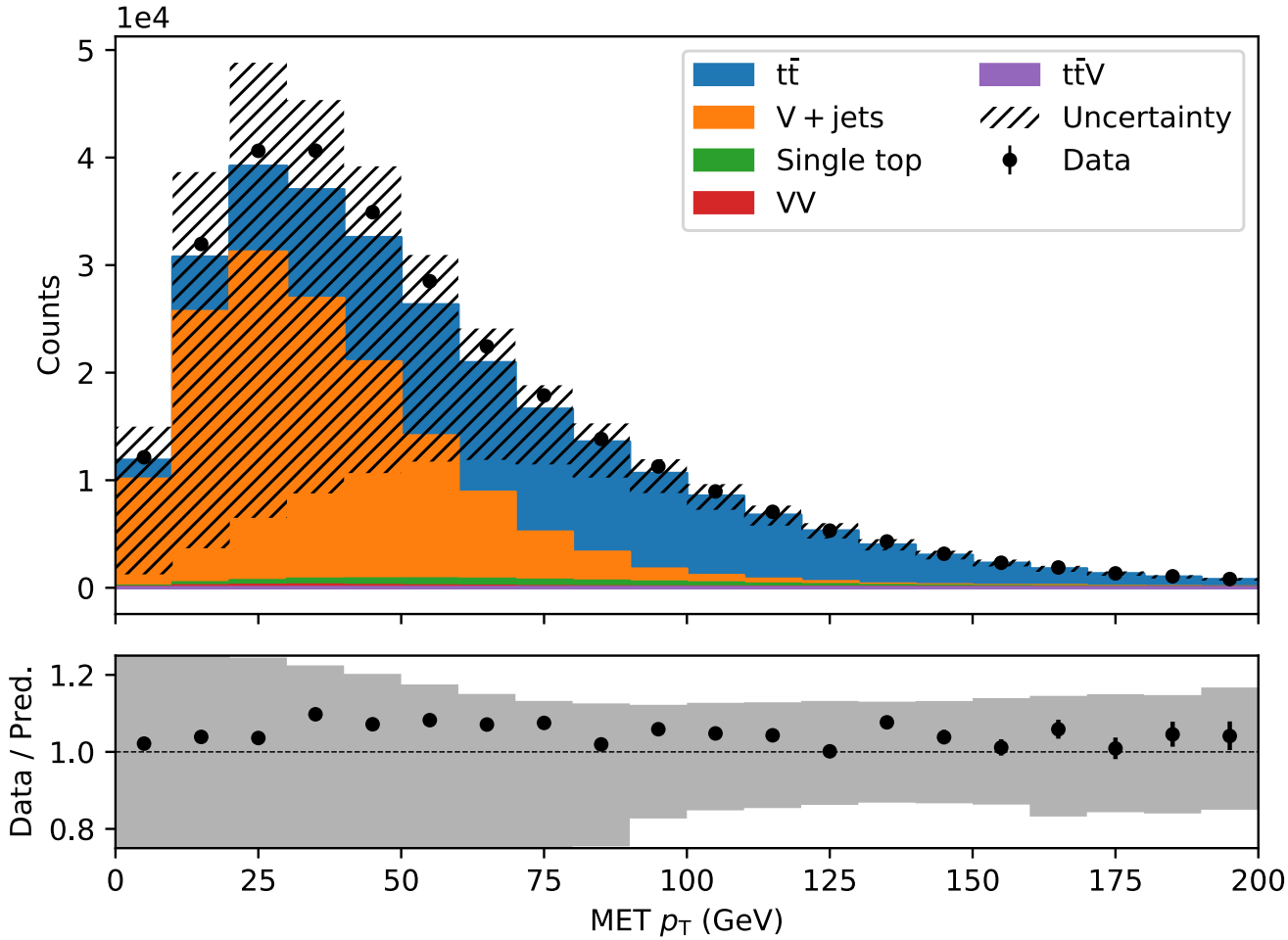
- Electron efficiency and identification
- Muon identification and isolation
- Luminosity (always 25 %)
- Cross sections
- h_{damp}
- Event tune
- Top-quark mass
- Matrix-element factorization and renomalization
- Parton shower initial and final state radiation

Yet to do

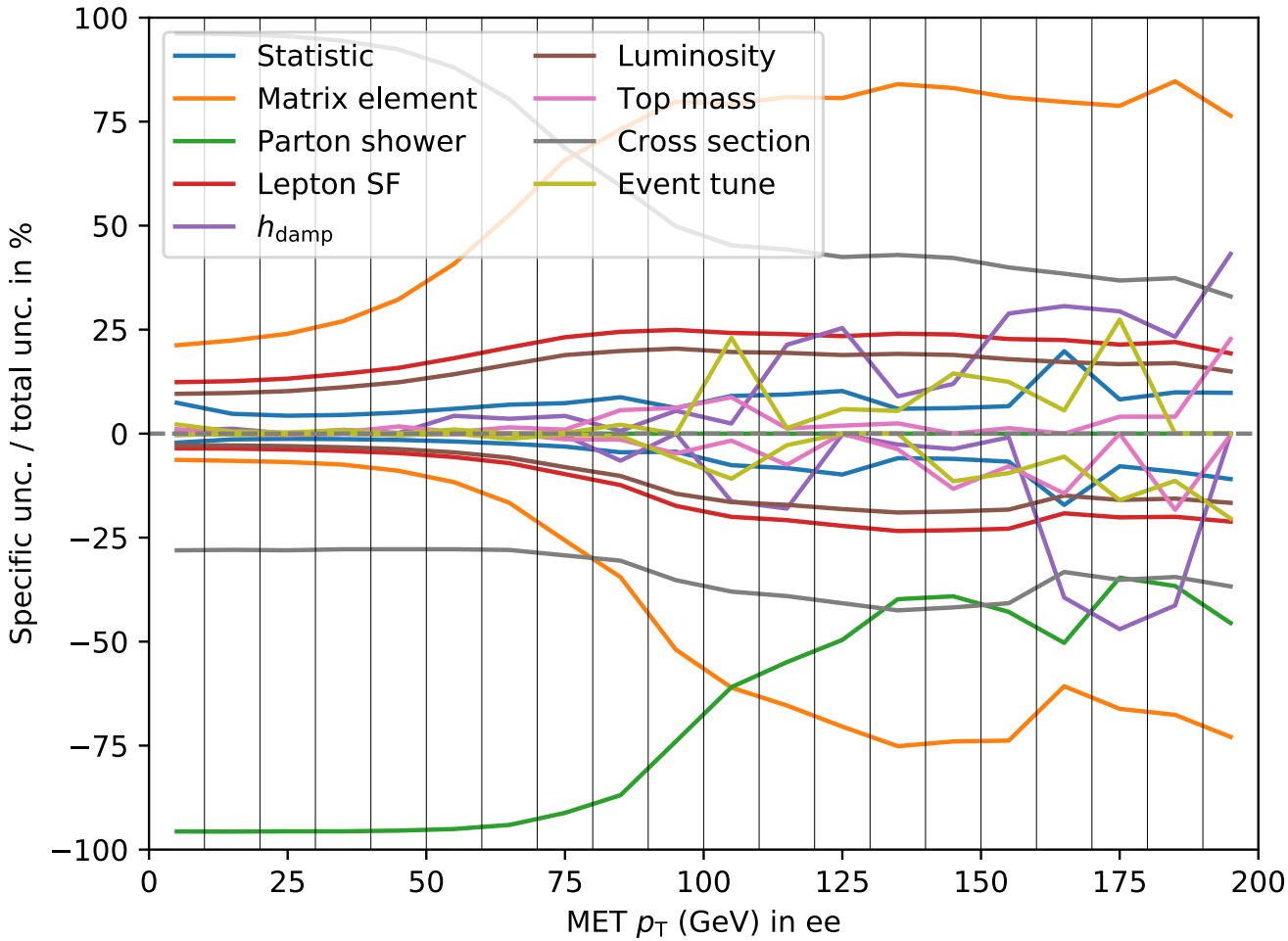
- B tagging
- Jet energy scale
- Jet energy resolution
- Unclustered $E_{\text{T,miss}}$

Missing transverse energy in ee

Huge uncertainties!



Impact of uncertainty sources



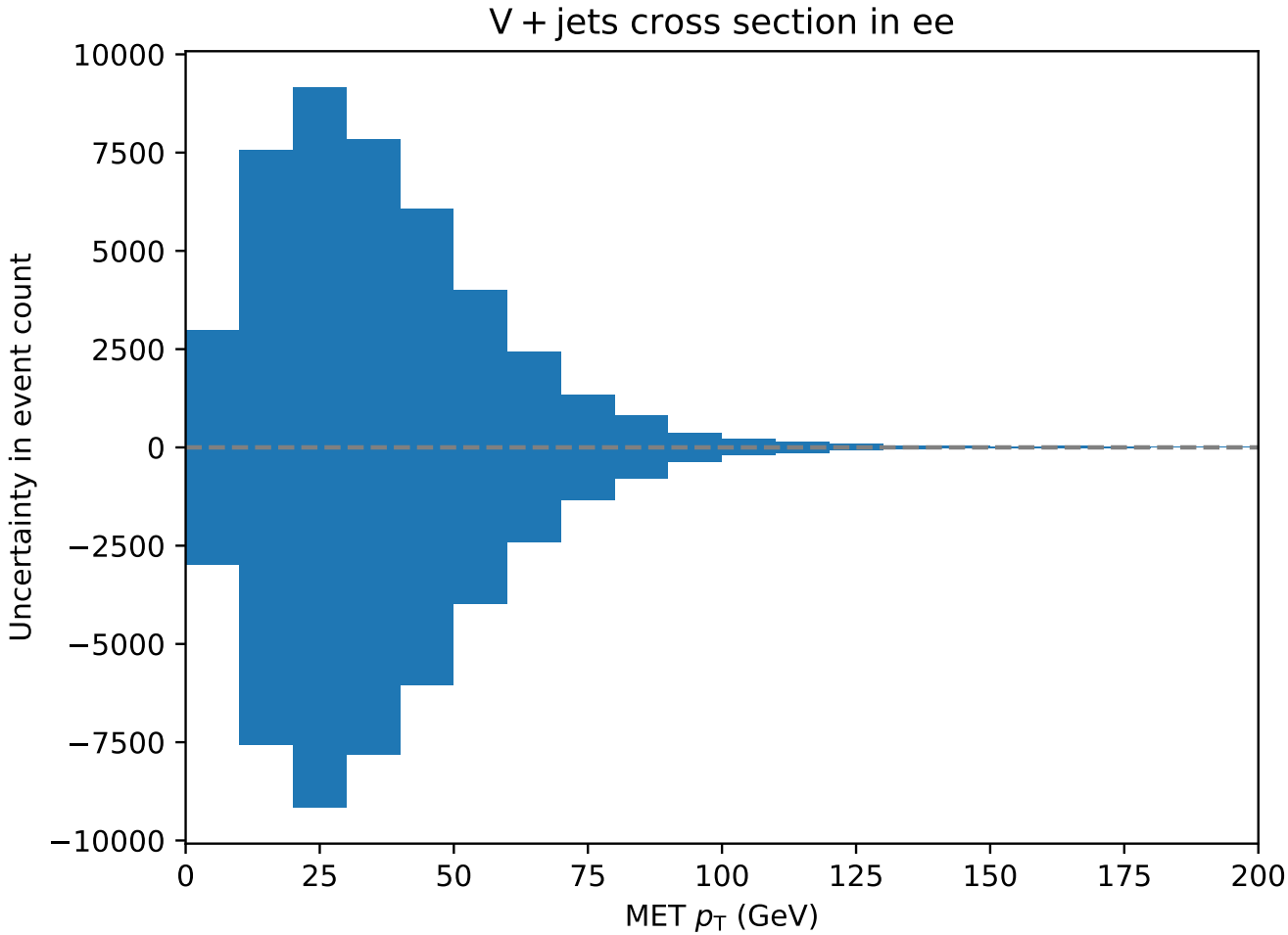
Much uncertainty comes from the cross section, matrix element and the parton shower.

Cross section uncertainties

Assumed uncertainties as in 2016

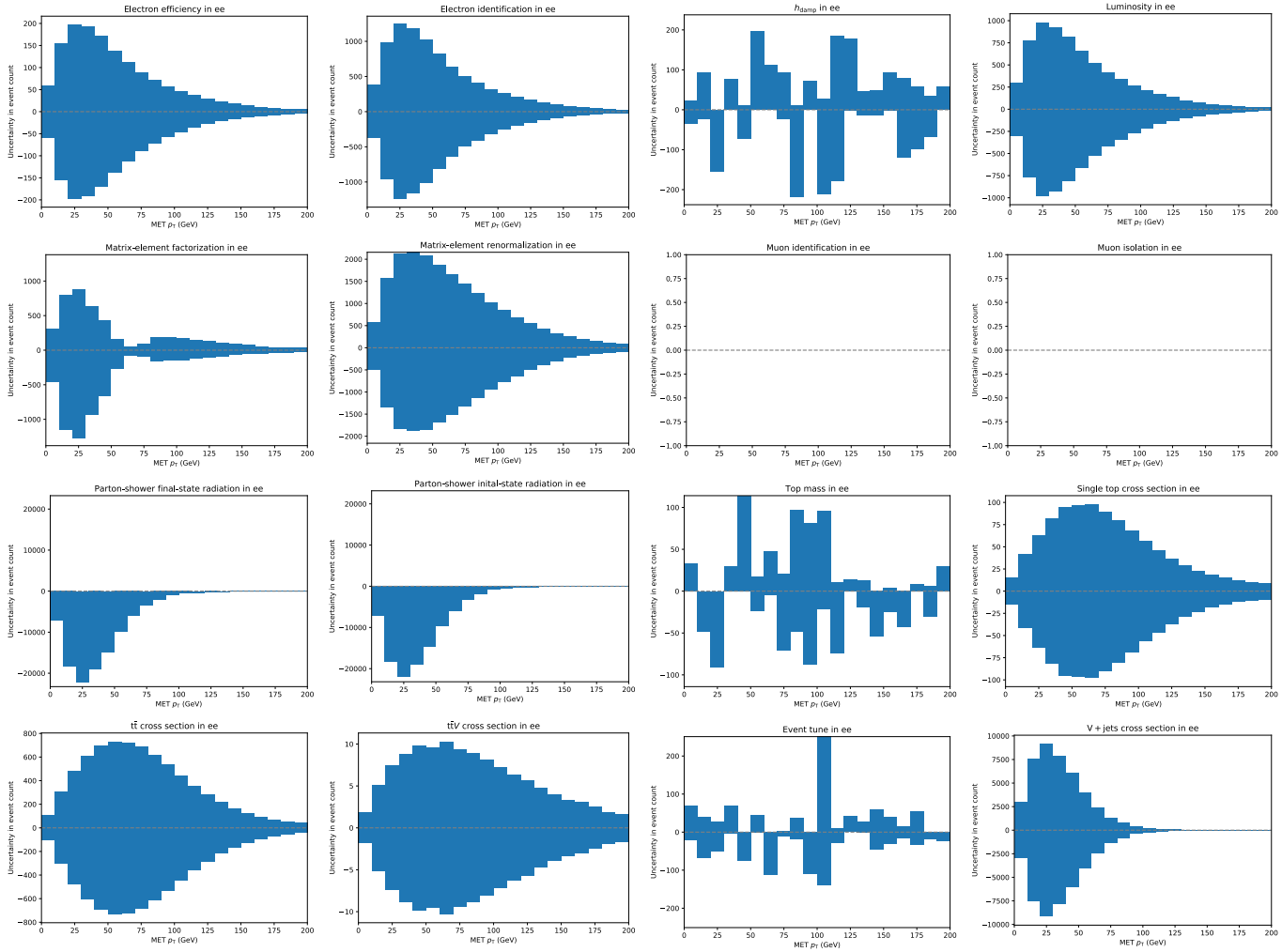
- Drell-Yan and W+Jets: 30 %
- Single top : 15 %
- $t\bar{t}$: 6 %
- $t\bar{t}$+V: 30 %
- Diboson: 30 %

Cross section uncertainties

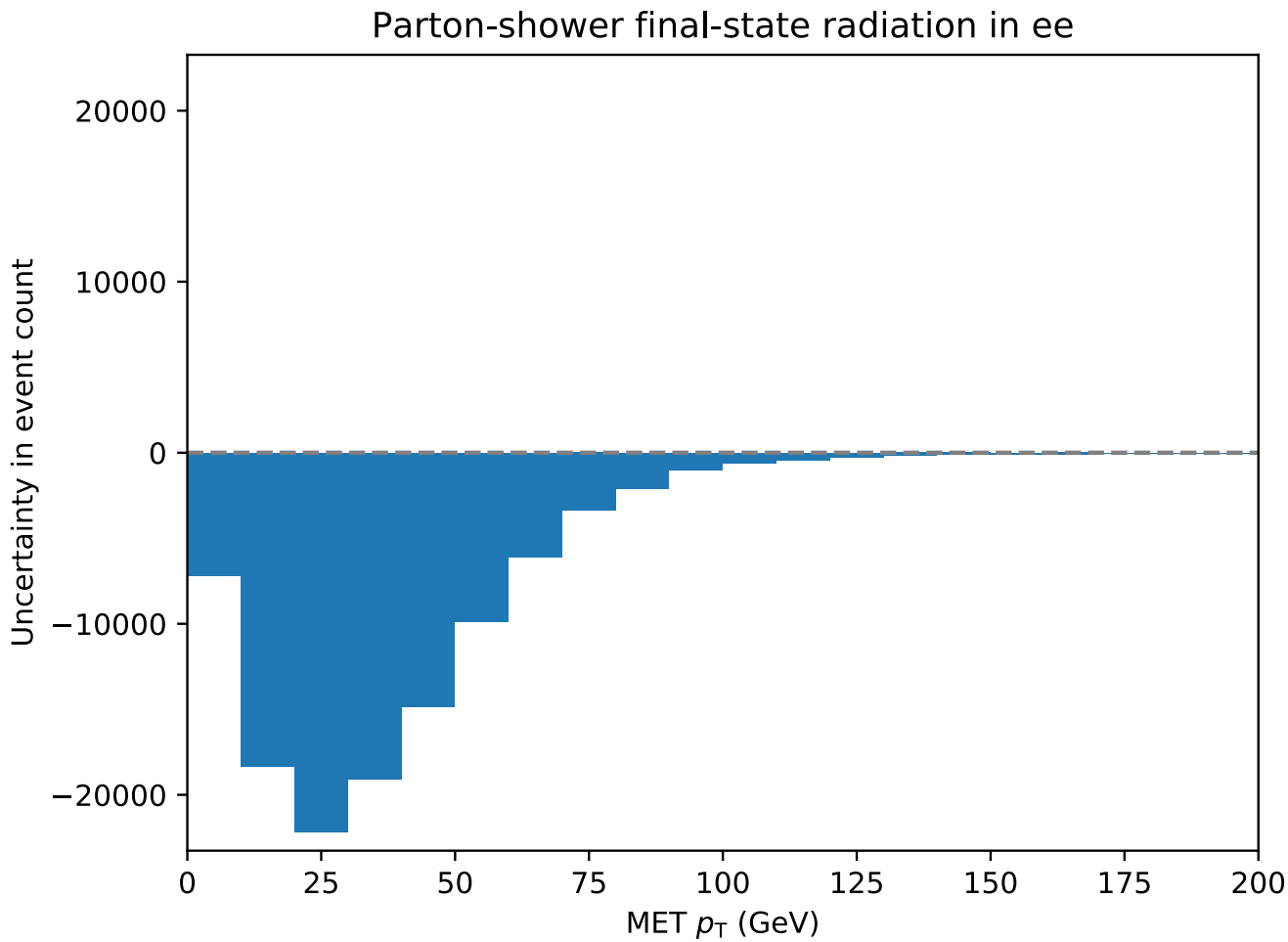


Large impact, but as expected.

All uncertainties as glance



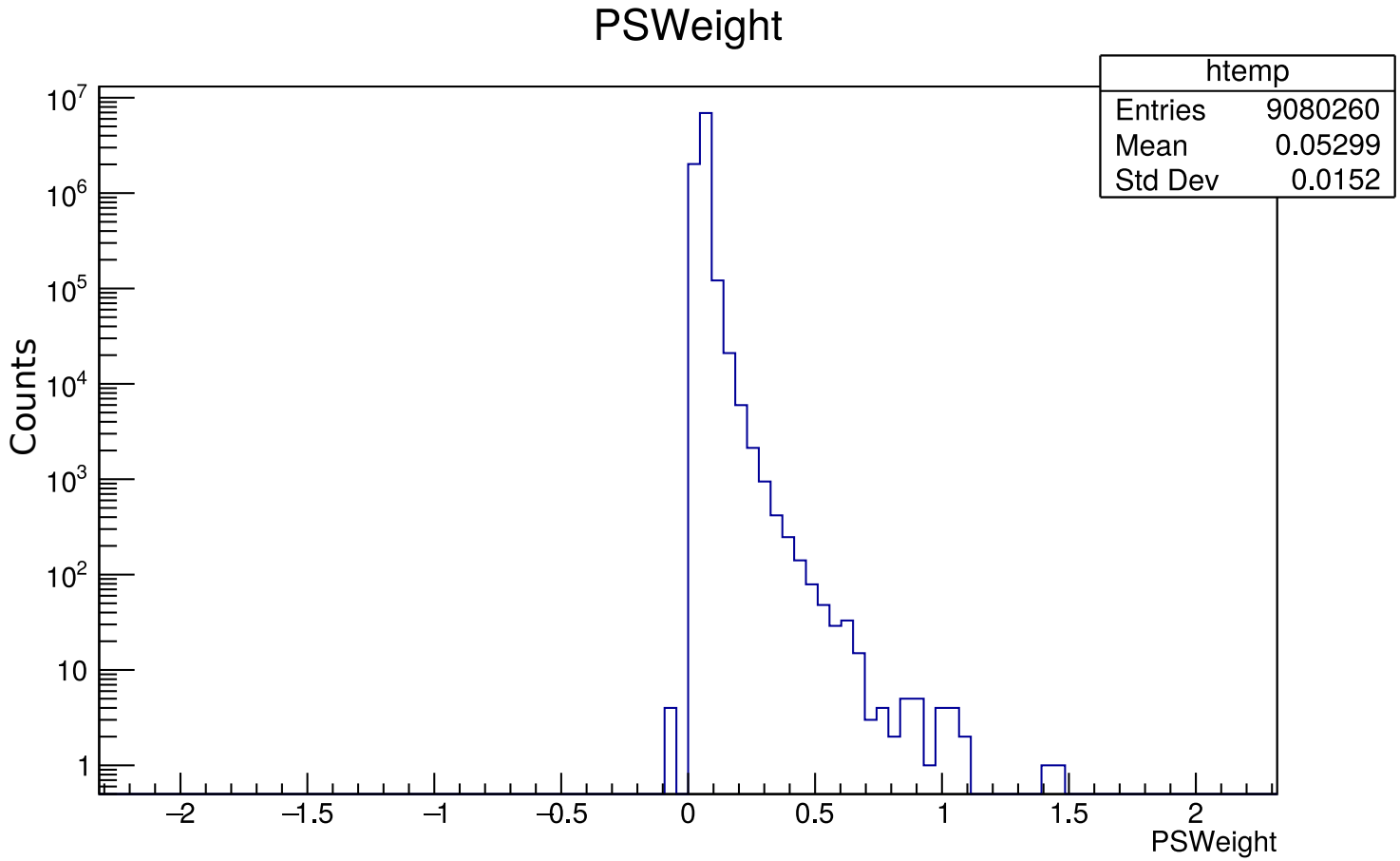
Parton shower uncertainty



This can’t be right.

Looking at the NanoAODs

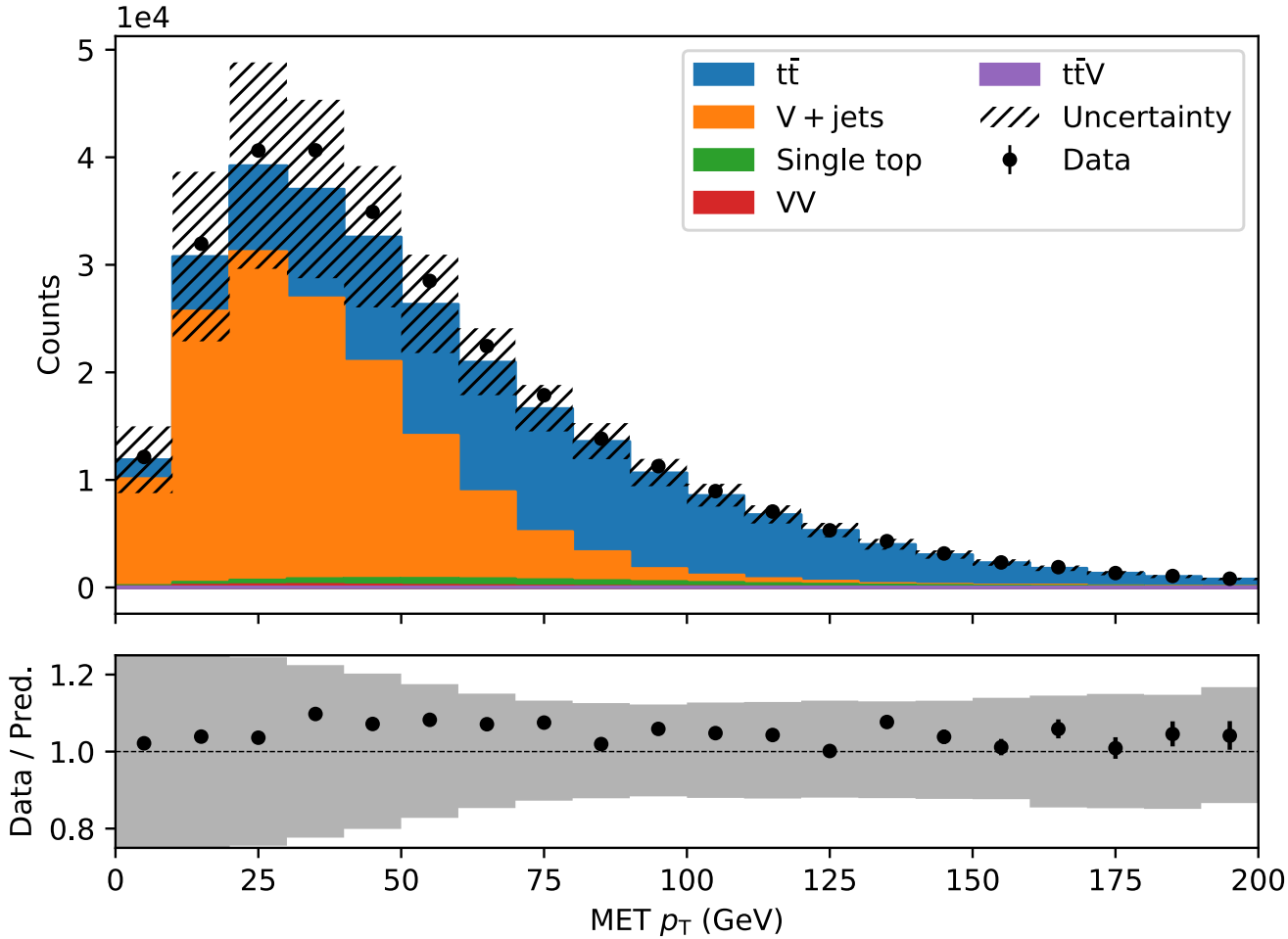
Leading-order Drell-Yan NanoAODv5 (v6 is the same)



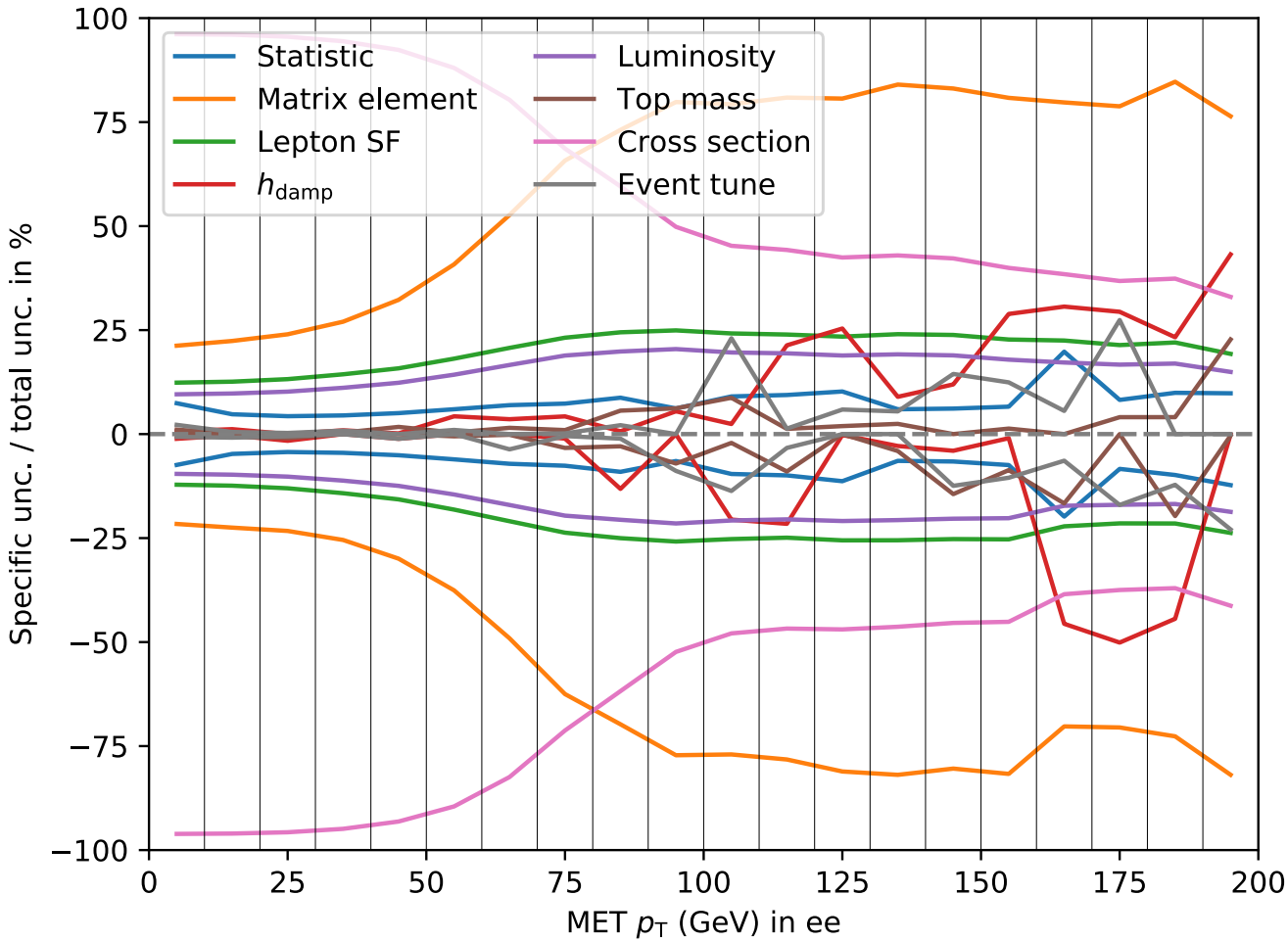
Seems to be broken.

Missing transverse energy in ee

Now without parton shower uncertainties



Impact of uncertainty sources



Thank you