Status of 4Top analysis

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Top pt reweighting

- Top pT in MC is higher than that in data.
- Recommendation from Top PAG : SF=Exp(0.0615-0.0005*pT) for data/POWHEG+PYTHIA8
- weight : $w = \sqrt{SF_t SF_{\bar{t}}}$
- At generator level

Njet reweighting

- Data deficit is observed in $t\bar{t}+ \geq 4jets$ region.
- In our categories:

category	Njet selection	number of jet associated with $t\bar{t}$
1Tau+0L	≥ 8	$t\bar{t}(\rightarrow \tau\nu + 4jet)+ \geq 4jets$
1Tau+1L	≥ 6	$t\bar{t}(\rightarrow \tau\nu + l\nu + 2jet)+ \geq 4jets$
1Tau+2L	≥ 4	$t\bar{t}(\rightarrow 2l2\nu + 2jet)+ \geq ?jet$
1Tau+3L	≥ 2	no Njet reweighting
2Tau+0L	≥ 6	$t\bar{t}(\rightarrow 2\tau2\nu + 2jet)+ \geq 4jet$
2Tau+1L	≥ 4	$tt(\rightarrow ? + 2jet)+ \geq ?jet$
2Tau+2L	≥ 2	no Njet reweighting

- Plan a B-only fit to data after pre-selection
- There is QCD background in 1Tau+0L.
- 1Tau+2L category has low statisitcs
- So perform a B-only fit in 1Tau+1L cateogry in 6jet, 7jet, $\geq$8jet bins.

Njet reweighting

- When we do the fit, the exclusive $t\bar{t}$ is used, but the numbers of associated jets are different among different decay mode for a given category.
- In 1Tau+1L category : full hadronic 9.5, SemiLeptonic 1121.3, 2L2Nu 1198.5

ttbb reweighting

sample	weight on ttbb	fraction ot ttbb	weight on non-ttbb
TTToHadronic	1.2	0.43%	0.999135
TTToSemiLeptonic	1.2	0.40%	0.999211
TTTo2L2Nu	1.2	0.36%	0.999282

- Weight on non-ttbb is defined by (1-1.2*$frac_{ttbb}$)/(1-$frac_{ttbb}$)
- This categorization of ttbb is done at generator level.
- Do not consider any weight yet. I should include genWeight at least.

General News

- Move to Ultra-Legacy
- Updated Luminosity
- UL recommendation of EGamma