

Status of 4Top analysis

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Updates since last week

- GoldenJson cut : $[1, 1283]$ means $1 \leq lumiBlock \leq 1283$ not $1 < lumiBlock < 1283$
- HT cut : I require $HT > 450 \text{ GeV}$. 400 GeV was used last week.
- Phase Space Extrapolation Factor(PSEF) for b-shape calibration :

$$PSEF = \frac{\sum w_{gen}}{\sum (w_{gen} * w_{btag})}$$

- In last iteration, I only compute bshape SF in 1Tau1L/1Tau2L/2Tau1L/2Tau2L categories and set the SF to 1 in remaining categories, so the PSEF was wrong.
- Now, I compute the bshape SF and PSEF after preselection(METFilter + trigger + one loose tau + two jets).
- When make the uncertainty band, we need corresponding PSEF

$$PSEF = \frac{\sum w_{gen}}{\sum (w_{gen} * w_{btagUp/Down})}$$

Hi Yu,

the iterative fit scale factors are normalized in this way after the derivation to ensure they only have a shape changing effect. This is done for all uncertainties. But this might depend on the samples you are using or your event selection, so if you see an effect for the central scale factor, you should consider to also check the uncertainties.

Cheers,

Svenja

Cutflow updates —2016preAPV

category	Data	signal	ttbar	Single top	TTX	QCD	(data-mc)/mc
1Tau0L	7121.00	4.19	2567.48	181.90	72.07	2133.55	0.437
1Tau1L	1008.00	4.01	954.65	65.10	40.86	7.54	-0.056
1Tau2L	25.00	0.72	17.05	0.86	7.87	0.00	-0.030
1Tau3L	1.00	0.03	0.00	0.00	0.36	0.00	1.743
2Tau0L	103.00	0.17	64.00	5.03	5.52	3.56	0.319
2Tau1L	2.00	0.08	4.73	0.01	1.77	0.00	-0.693
2Tau2L	0.00	0.01	0.00	-0.00	0.11	0.00	-1.000

category	Data	signal	ttbar	Single top	TTX	QCD	(data-mc)/mc
1Tau0L	6771.00	4.15	2410.96	175.18	68.25	-	1.551
1Tau1L	884.00	2.80	648.42	45.60	28.46	-	0.224
1Tau2L	21.00	0.47	10.16	0.67	5.05	-	0.323
1Tau3L	1.00	0.03	0.00	-0.00	0.27	-	2.669
2Tau0L	83.00	0.16	52.90	3.20	4.77	-	0.363
2Tau1L	2.00	0.05	3.07	0.02	1.36	-	-0.550
2Tau2L	0.00	0.00	0.00	-0.00	0.07	-	-1.000

- Top : old, Bottom : new
- I haven't finished running the QCD samples.
- The old PSEF is close to 1.
- The updated PSEF is 0.808 in ttbar sample.

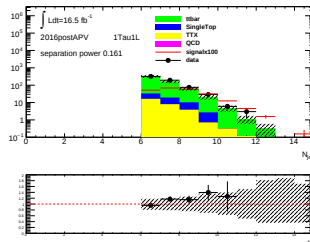
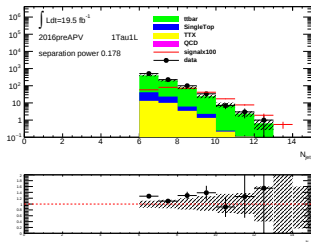
Cutflow updates —2016postAPV

category	Data	signal	ttbar	Single top	TTX	QCD	(data-mc)/mc
cat1	5722.00	3.30	2041.00	136.63	56.96	898.71	0.826
cat2	758.00	2.86	674.63	42.07	39.05	0.00	0.003
cat3	15.00	0.54	12.05	0.17	7.29	0.00	-0.231
cat4	0.00	0.03	0.02	0.00	0.53	0.00	-1.000
cat5	89.00	0.14	46.94	5.47	4.09	4.70	0.454
cat6	4.00	0.06	3.26	0.04	1.59	0.00	-0.181
cat7	0.00	0.00	0.00	-0.00	0.16	0.00	-1.000

category	Data	signal	ttbar	Single top	TTX	QCD	(data-mc)/mc
1Tau0L	5267.00	3.25	1899.10	132.31	53.30	-	1.526
1Tau1L	626.00	2.29	525.82	36.79	29.53	-	0.057
1Tau2L	11.00	0.40	8.66	0.11	4.74	-	-0.186
1Tau3L	0.00	0.03	0.02	-0.00	0.37	-	-1.000
2Tau0L	76.00	0.13	37.54	3.58	3.39	-	0.708
2Tau1L	4.00	0.05	2.06	0.03	1.02	-	0.285
2Tau2L	0.00	0.00	0.00	-0.00	0.08	-	-1.000

- Top : old, Bottom : new
- I haven't finished running the QCD samples.
- The old PSEF is close to 1.
- The updated PSEF is 0.933 in ttbar sample.

N_{jet} in 1Tau1L



- The error band looks more reasonable.
- The trigger SF is to be updated.

- The samples are ready in Muon POG directory.
- I am checking the spark package.