



Expected yields after SF application and top tagger studies

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Currently implemented SFs



Yields and top
tagger

F. Lemmi

- Generator weight (not exactly a SF)
- Prefiring weight (not exactly a SF, right?)
- Pileup SF
- Trigger SF (using my 2D histogram `njets_vs_HT`)
- b tagging SF (using latest version of `evalEventSF.C` that I described during last meeting)
- Assume all the weights to be independent: **final weight is the product of weights**

Expected yields



	tttt	ttbar	QCD	tt+X	MC total	data	(D-MC)/D	Z
1tau0L	8.77	5392.31	6559.65	162.39	12123.13	13693.00	0.11	0.08
1tau1L	6.68	1628.15	2.15	69.22	1706.20	1633.00	-0.04	0.16
1tau2L	1.33	26.27	0.00	9.33	36.93	44.00	0.16	0.22
1tau3L	0.08	0.00	0.00	0.57	0.65	1.00	0.35	0.10
2tau0L	0.44	168.28	1.70	12.57	183.00	225.00	0.19	0.03
2tau1L	0.18	8.94	0.00	3.62	12.74	13.00	0.02	0.05
2tau2L	0.02	0.09	0.00	0.21	0.31	0.00	nan	0.03

- **Significances do not change dramatically** wrt no-SF scenario
- The procedure seems OK at first glance
- **Missing minor processes** (we have to agree on what processes and what cross sections to use)

Yields and top tagger

F. Lemmi



- We are currently **not using the top tagger information**
- Maybe it can be part of BDT input variable, not sure yet though
- Tried to see what happens when **using it in category definition**
 - **Scenario 1**: at least 1 resolved top candidate in every category
 - **Scenario 2**: per-category requirements on the number of resolved top candidates

Scenario 1



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	tttt	ttbar	QCD	tt+X	MC total	data	(D-MC)/D	Z
1tau0L	8.73	5350.91	6488.36	159.93	12007.93	13222.00	0.09	0.08
1tau1L	6.48	1493.34	2.15	65.32	1567.28	1502.00	-0.04	0.16
1tau2L	1.18	16.01	0.00	8.00	25.19	26.00	0.03	0.24
1tau3L	0.06	0.00	0.00	0.36	0.42	1.00	0.58	0.10
2tau0L	0.44	165.14	1.70	12.18	179.46	214.00	0.16	0.03
2tau1L	0.17	7.61	0.00	3.30	11.08	12.00	0.08	0.05
2tau2L	0.01	0.09	0.00	0.16	0.26	0.00	nan	0.03

- No dramatic changes wrt no-top-tagger scenario
- Significances unchanged except for 1tau2L (slight increase)
- No significant gain in data/MC agreement

Scenario 2



Yields and top
tagger

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	tttt	ttbar	QCD	tt+X	MC total	data	(D-MC)/D	Z
1tau0L	3.04	457.08	206.22	17.02	683.36	880.00	0.22	0.12
1tau1L	4.28	507.82	0.00	28.78	540.87	556.00	0.03	0.18
1tau2L	1.18	16.01	0.00	8.00	25.19	26.00	0.03	0.24
1tau3L	0.08	0.00	0.00	0.57	0.65	1.00	0.35	0.10
2tau0L	0.35	103.61	1.27	9.28	114.50	118.00	0.03	0.03
2tau1L	0.17	7.61	0.00	3.30	11.08	12.00	0.08	0.05
2tau2L	0.02	0.09	0.00	0.21	0.31	0.00	nan	0.03

- Nice **increase in significance for 1tau0L**
 - **QCD is hugely reduced!**
- Data/MC agreement looks OK