VLL in 1tau0L

Cut flow for each process（1tau1l

	Process	initial	METFilter	HLT	tauF>=1	jet>=6	bjet>1	HT>480&6thjet>38
0	tttt	799.93	798.40	682.77	170.34	151.48	138.83	105.55
1	tt	49754030.30	49720227.91	4017214.16	666905.99	380154.30	257346.88	109403.07
2	qcd	14880267801327.50	14879104461777.76	48938989.37	3271372.43	1676889.91	351294.21	126663.88
3	ttX	1063938.98	1062639.35	196875.23	34093.46	18789.45	12595.73	5963.60
4	Minor	23357118.38	23349793.73	6253.40	1136.25	395.68	107.04	39.31
5	singleTop	4294213.27	4291198.85	130872.99	21306.58	10506.55	6355.37	2793.49
6	WJets	36688820.97	36650752.95	51886.07	10335.06	4233.42	979.59	380.92
7	DY	1309512370.25	1309384072.68	9560.64	340.50	100.15	30.04	0.00
8	VLLm600	685.41	683.42	573.47	320.59	197.74	190.70	121.46

	Process	initial	METFilter	HLT	tauF>=1	jet>=6	bjet>1	HT>480&6thjet>38
0	qcd_200to300	102967430000.00	102936958178.31	1986199.60	111342.11	34120.97	1795.84	0.00
1	WJetsToLNu_HT-2500ToInf	1483.78	1457.12	71.67	12.88	8.66	2.65	1.86
2	zz	987195.00	986736.12	1532.03	182.82	57.12	29.96	9.52
3	st_tW_top	2144905.55	2143409.49	65259.41	10695.39	5286.76	3192.71	1410.59
4	ttbar_2l	5282390.93	5279709.36	132600.31	36192.69	10645.95	7540.13	2679.22
5	ZGToLLG	3319368.25	3318559.95	431.24	130.65	28.15	6.37	2.12
6	WGToLNuG	11487360.47	11484752.05	868.02	201.87	54.35	14.29	4.35
7	ttG	950698.74	949542.07	160633.01	26878.60	13949.58	9045.88	4055.24
8	DYJetsToLL_M-50	363600070.25	363529887.72	7798.06	0.00	0.00	0.00	0.00
9	ZZZ	883.09	882.29	21.88	3.51	1.56	0.86	0.30
10	qcd_50to100	147540780000000.00	147529607240424.62	6115776.81	382236.05	382236.05	0.00	0.00
11	qcd_2000toInf	1510707.50	1489670.58	69227.85	3643.04	2649.43	764.25	555.97
12	WJetsToLNu_HT-600To800	741892.00	739973.54	10975.99	2102.91	987.30	218.09	101.40
13	ttbar_0l	22613347.04	22596186.26	2612755.42	371605.52	246626.45	164410.97	72747.11
14	qcd_700to1000	408459410.00	407560595.96	7174075.19	425454.42	244544.72	61302.49	33017.45
15	st_tW_antitop	2144905.43	2143393.22	65407.98	10547.24	5202.90	3150.91	1379.06
16	WJetsToLNu_HT-1200To2500	61206.09	60670.08	2734.78	465.98	277.88	66.51	42.08
17	DYJetsToLL_M-10to50	945912300.00	945854184.96	1762.58	340.50	100.15	30.04	0.00
18	VLL_NN_M600	117.61	117.33	104.11	60.08	45.37	43.20	29.82
19	WWZ	9877.93	9864.48	266.67	48.53	25.14	8.22	4.13
20	VLL_EN_M600	443.41	442.12	372.59	208.70	129.87	125.56	79.35
21	qcd_500to700	1918149800.00	1915801132.90	14539046.50	972241.48	473446.11	128462.23	51634.49
22	ttbar_1l	21858292.32	21844332.29	1271858.43	259107.77	122881.91	85395.78	33976.73
23	ww	7059940.00	7056719.62	2762.90	462.88	188.67	37.82	14.86
24	qcd_300to500	20814857000.00	20802933579.27	16512782.27	1240924.98	452044.00	136829.46	27365.89
25	WJetsToLNu_HT-800To1200	345219.10	343728.45	9383.28	1680.45	892.04	194.10	107.35
26	ttH_nonbb	12504.47	12490.27	3800.28	992.38	664.99	452.43	232.34
27	ttH_bb	17332.75	17316.43	8354.86	1339.57	888.79	830.89	410.92
28	ttW	36556.13	36504.04	9477.63	1959.26	1291.99	854.21	486.56
29	WWW	12480.54	12464.71	145.61	29.41	15.48	2.01	1.32
30	qcd_1500to2000	7179600.00	7114357.12	311275.74	15299.31	10756.47	2815.48	1944.56
31	WZTo3LNu	294202.05	294085.20	75.29	30.91	7.35	1.45	0.23
32	ttZ	46846.89	46786.54	14609.46	2923.66	1994.10	1412.32	778.55
33	ggH_tautau	182481.50	182404.17	33.41	25.26	7.28	1.62	0.55
34	WJetsToLNu_HT-400To600	3685528.00	3679608.60	19504.40	4004.36	1535.80	360.93	107.44
35	WZZ	3329.54	3325.14	116.37	20.43	10.58	4.43	1.92
36	tttt	799.93	798.40	682.77	170.34	151.48	138.83	105.55
37	WJetsToLNu_HT-200To400	31853492.00	31825315.16	9215.94	2068.47	531.75	137.31	20.79
38	VLL_EE_M600	124.39	123.97	96.77	51.81	22.50	21.94	12.30
39	st_tZq	4402.29	4396.14	205.60	63.95	16.89	11.75	3.83
40	qcd_1000to1500	72214810.00	71880239.00	2230605.42	120231.04	77092.15	19324.46	12145.51

Input list

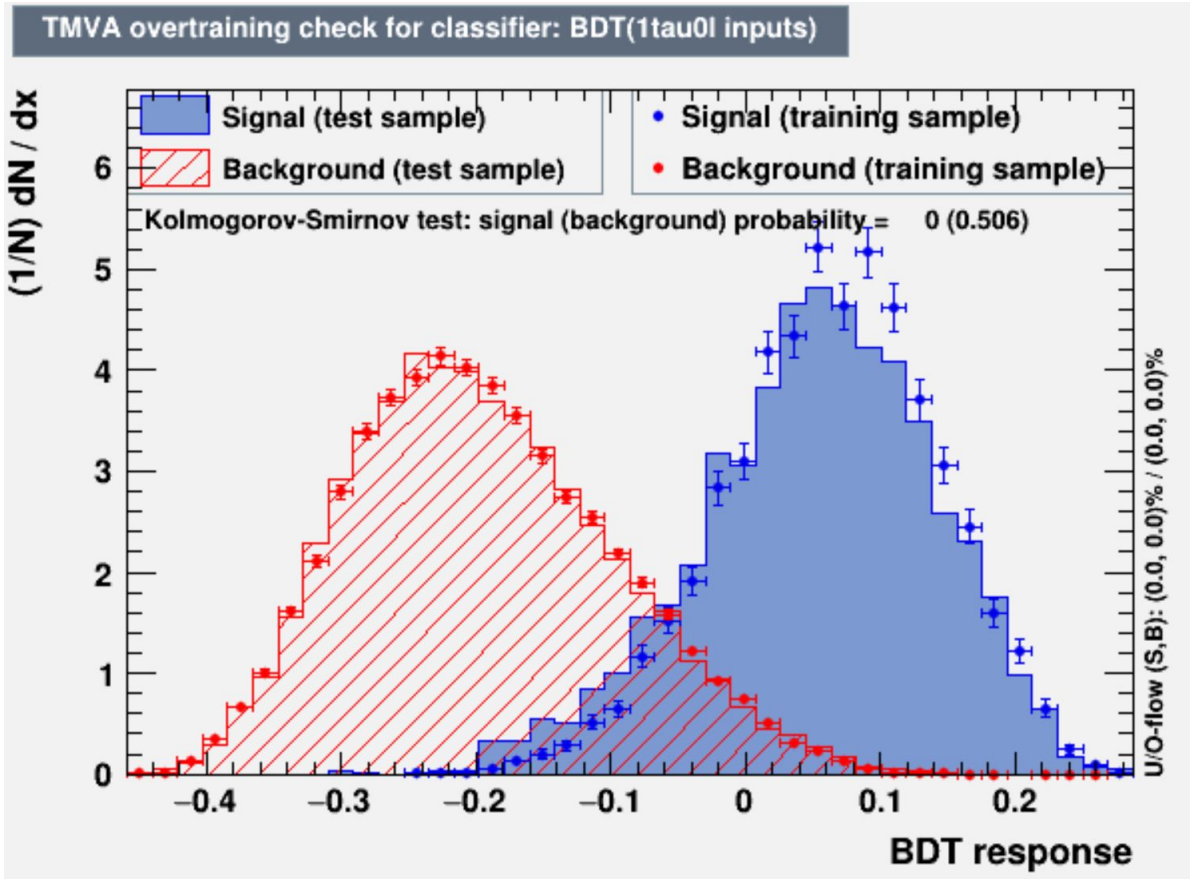
```
tausF_num
tausF_1pt
tausF_MHT
tausF_HT
tausF_invariantMass
tausF_minDeltaR
tausF_prongNum
tausF_1decayMode
tausF_1prongNum
tausF_1jetPt
tausF_1jetEtaAbs
tausF_1charge
tausF_1neutralIso
tausF_1Met_transMass
jets_num
jets_1pt
jets_rationHT_4toRest
jets_MHT
jets_HT
jets_invariantMass
jets_transMass
jets_minDeltaR
jets_centrality
jets_average_deltaR
jets_4largestBscoreSum
jets_4largestBscoreMulti
jets_HTDivideMET
jets_METDivideHT
jets_sphericity
jets_aplanarity
jets_1btag
jets_2btag
jets_3btag
jets_4btag
jets_5btag
jets_6btag
jets_7btag
jets_8btag
jets_9btag
jets_2pt
```

```
jets_2pt
jets_3pt
jets_4pt
jets_5pt
jets_6pt
jets_7pt
jets_8pt
jets_9pt
bjetsM_num
bjetsM_1pt
bjetsM_MHT
bjetsM_HT
bjetsM_invariantMass
bjetsM_transMass
bjetsM_minDeltaR
bjetsM_2MET_stransMass
bjetsM_tausF_minDeltaR
bjetsM_2pt
bjetsM_3pt
bjetsT_num
bjetsT_1pt
bjetsT_MHT
bjetsT_HT
bjetsT_invariantMass
bjetsT_transMass
bjetsT_minDeltaR
bjetsT_2MET_stransMass
bjetsT_tausF_minDeltaR
bjetsT_2pt
bjetsT_3pt
MET_pt
```

解释下tau的cut效率

come soon!

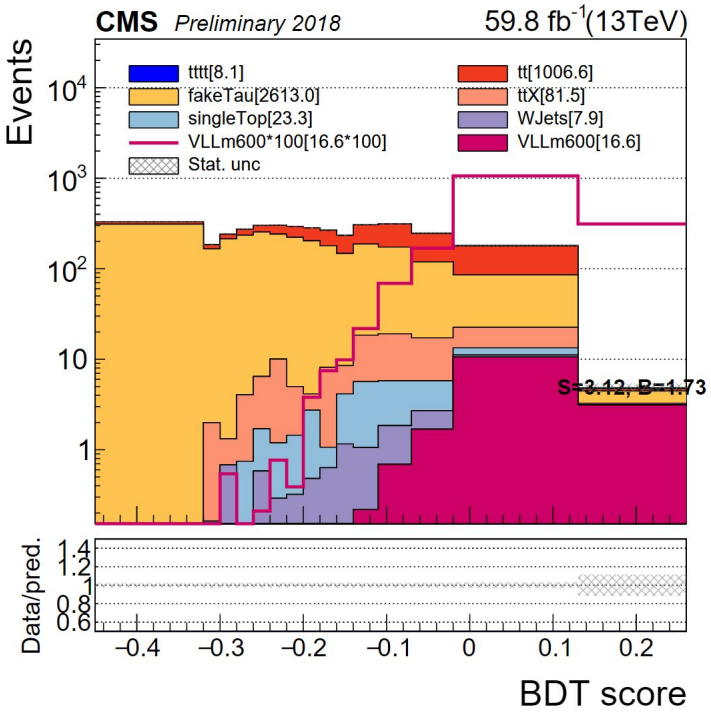
Overtraining check at VLLm600 for 2018



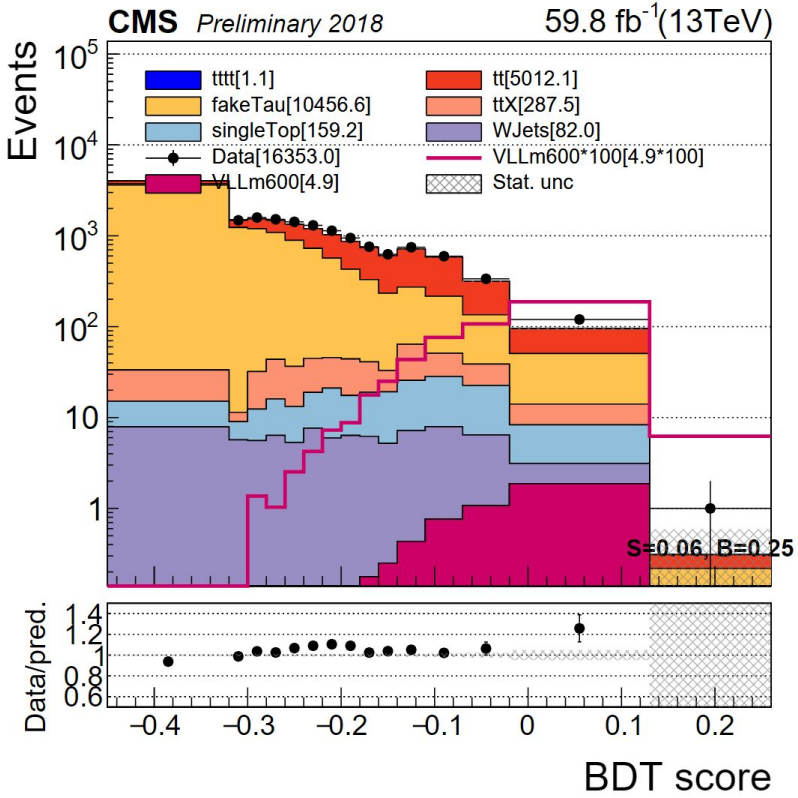
AUC score: 0.96
n_bkg: 984359
n_sig: 11705

60% samples are used for training

BDT distribution for 2018

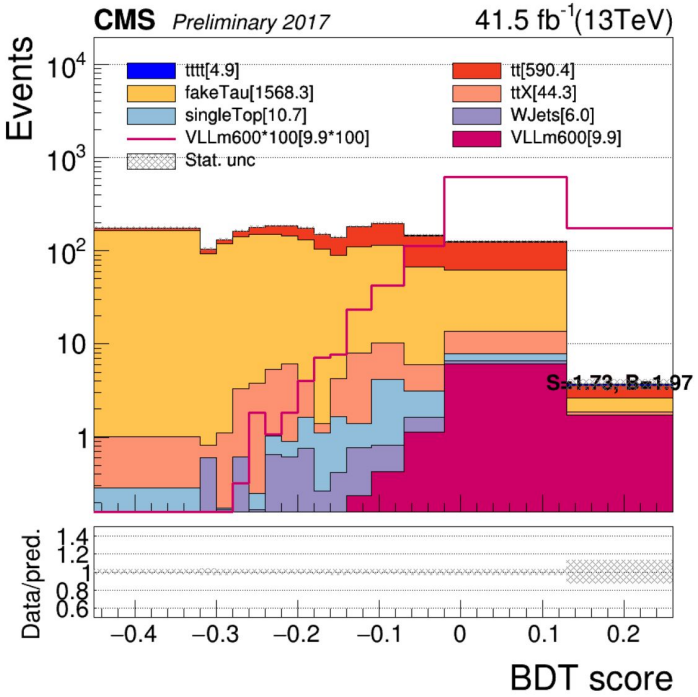


SR of 1tau0l for 2018

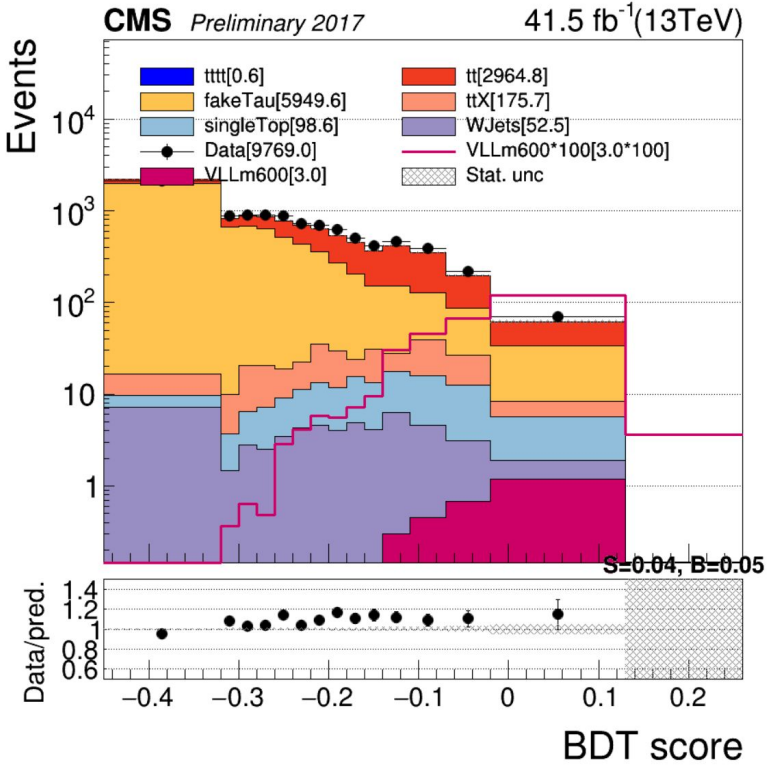


CR of 1tau0l for 2018

BDT distribution for 2017

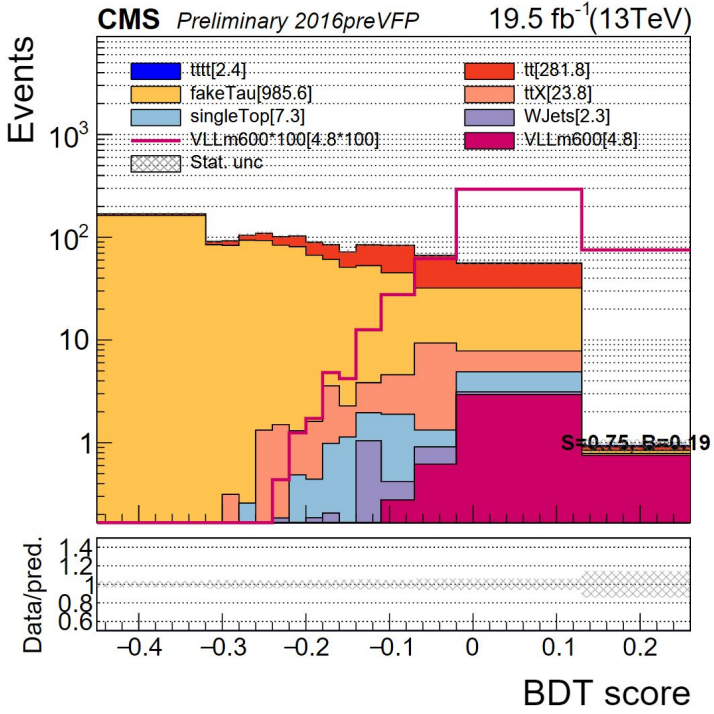


SR of 1tau0l for 2017

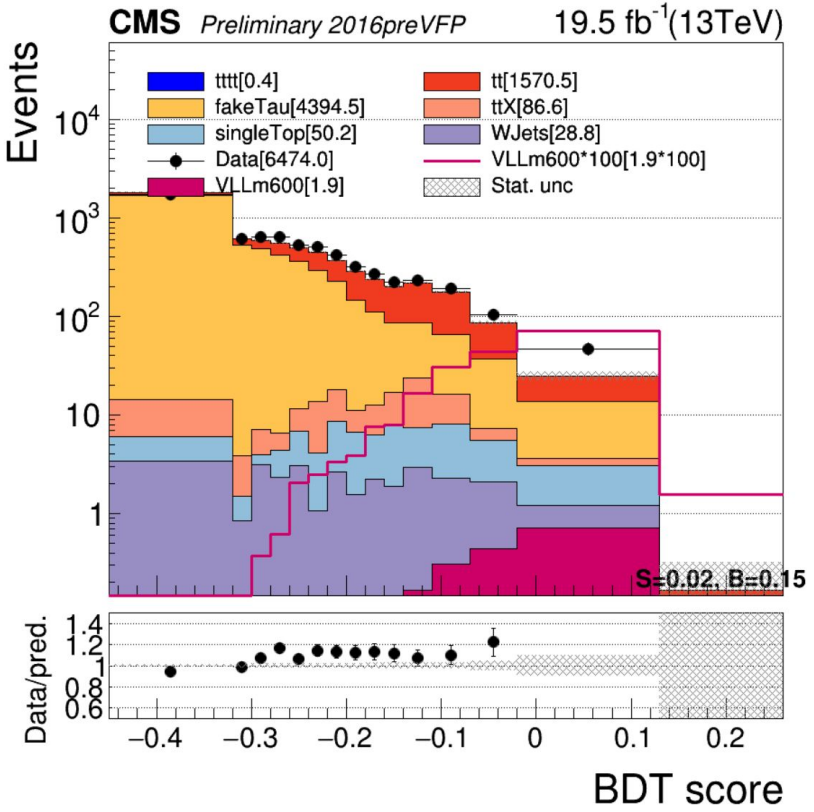


CR of 1tau0l for 2017

BDT distribution for 2016preVFP

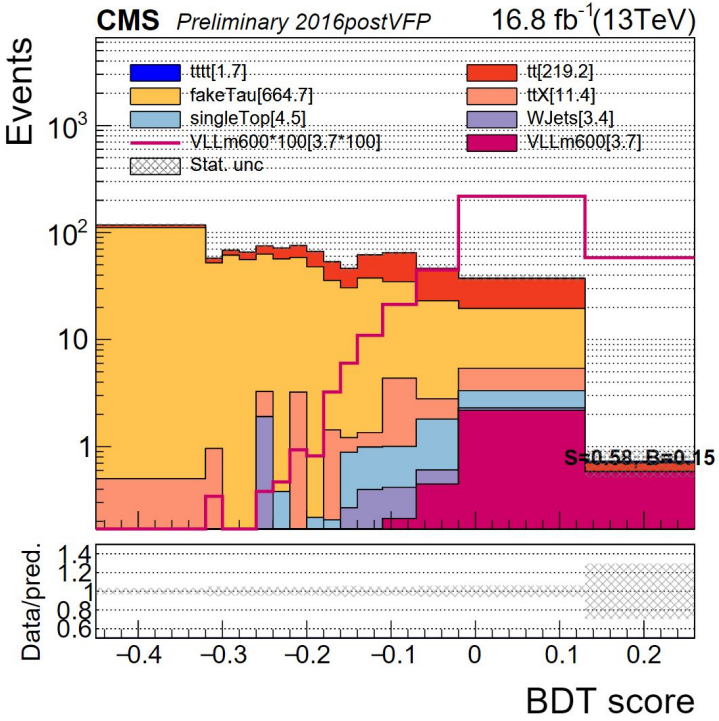


SR of 1tau0l for 2016preVFP

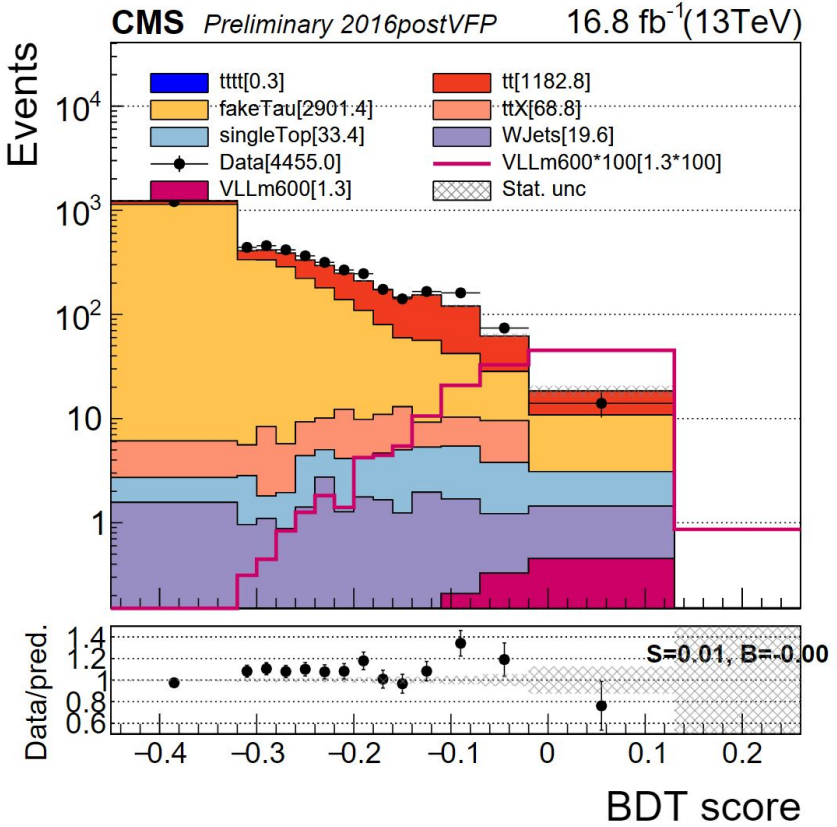


CR of 1tau0l for 2016preVFP

BDT distribution for 2016postVFP

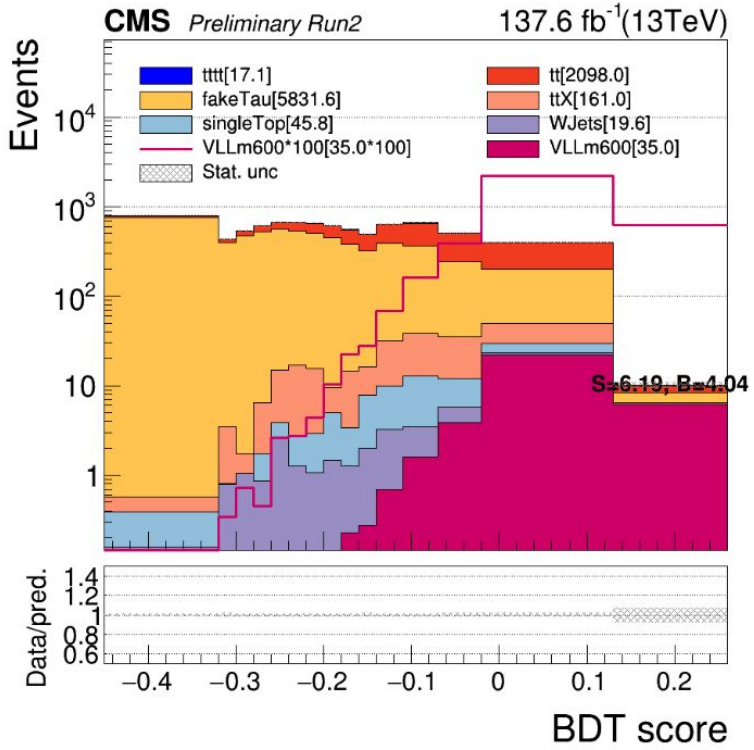


SR of 1tau0l for 2016postVFP

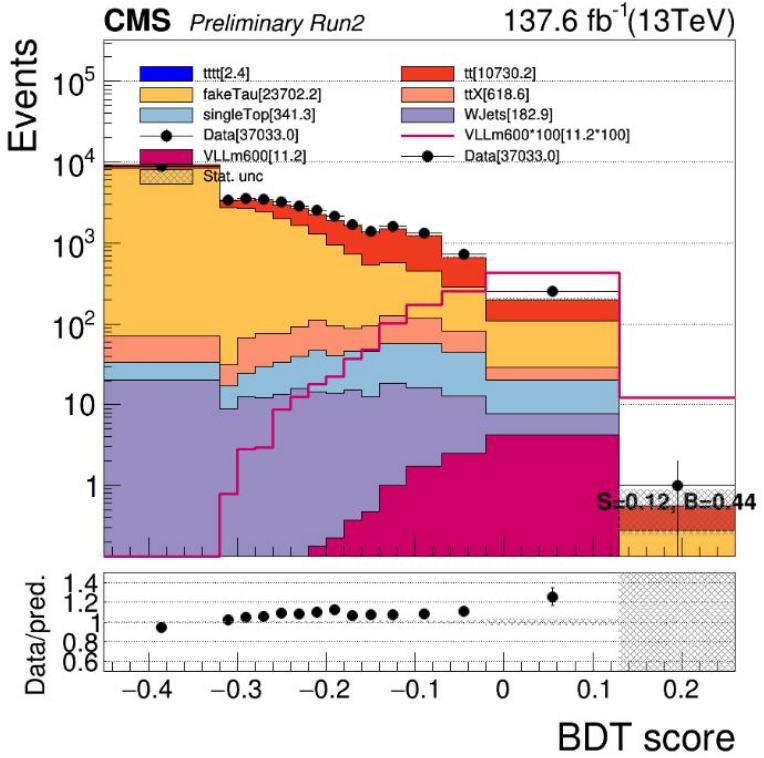


CR of 1tau0l for 2016postVFP

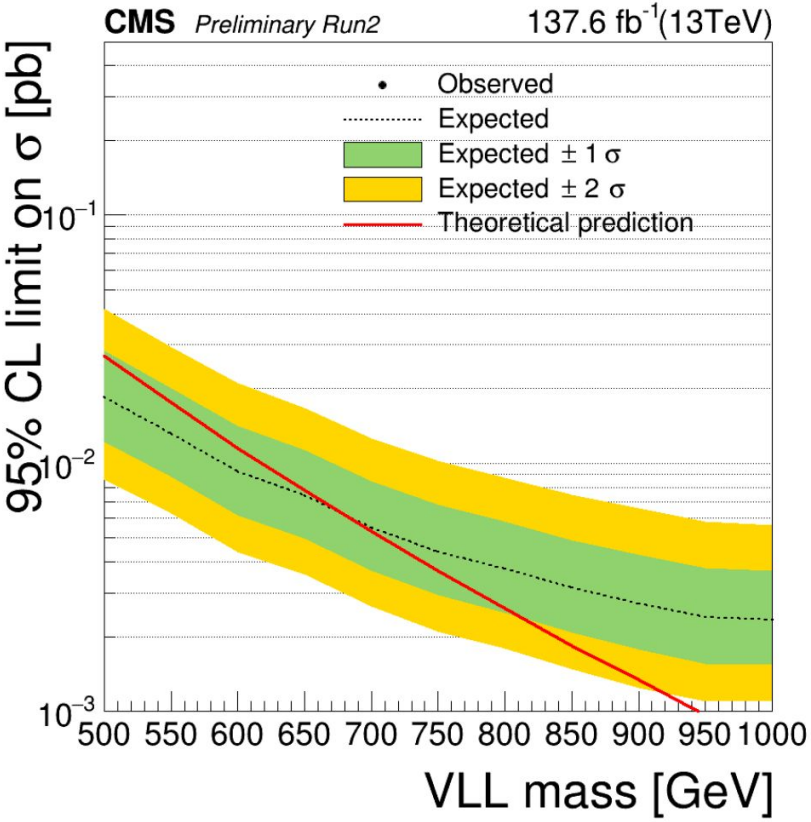
BDT distribution for Run2

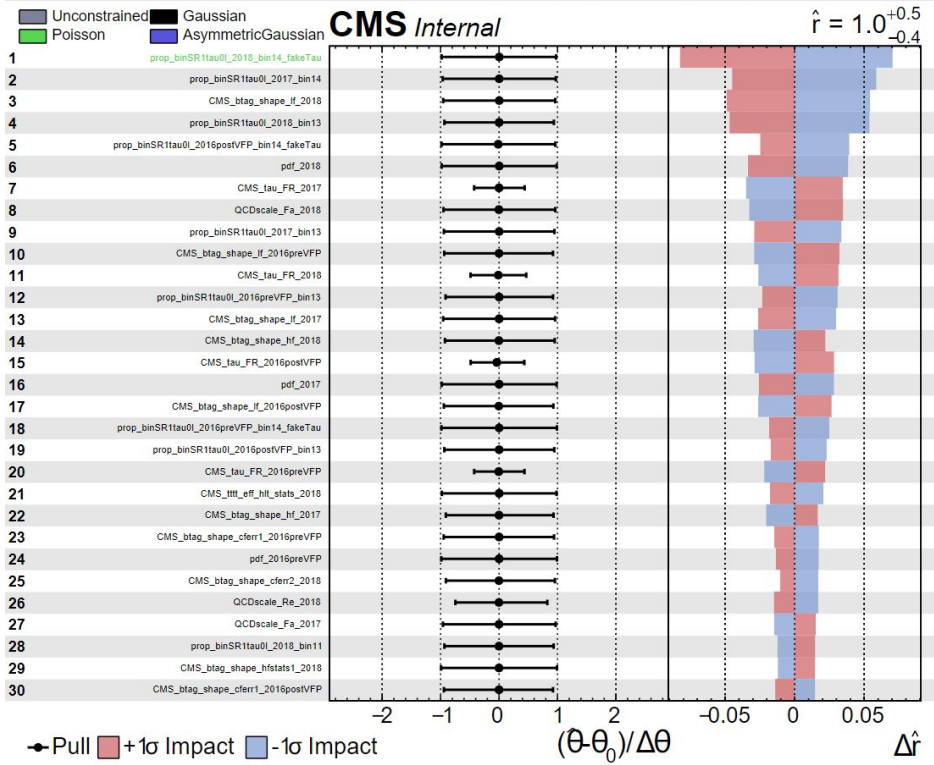


SR of 1tau0l for Run2



CR of 1tau0l for Run2





Combination of 1tau0l for Run2

Combination of 1tau0l 1tau1l 1tau2l for Run2