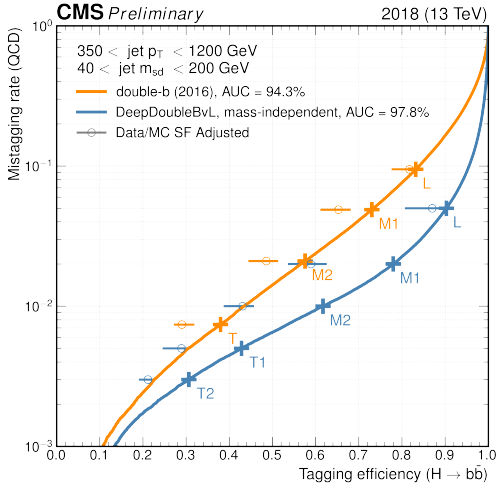
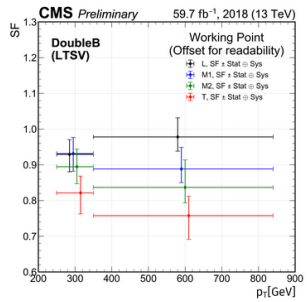
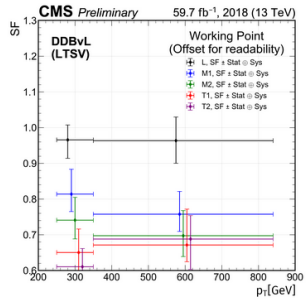
Updates: March 9

- FatJet DeepDoubleB tagger is different for nanoaod v7 (DDBvL) and v9 (DDBvLV2).
- For v7 using medium M1 working point, which has 77% signal efficiency and 2% mistag efficiency.
- For v9, ask ?

Deep Double B Tagger

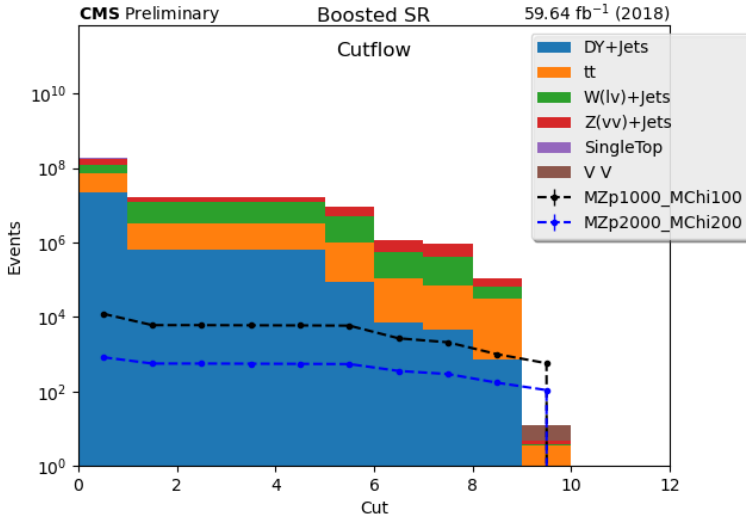


Tagger	Figure	WP	Cut	pT	SF	Uncert (up/down)
doubleB pfBoostedDoubleSecondaryVertexAK8BJetTags		L	0.3	250-350	0.93	0.04/0.04
				350-850	0.98	0.05/0.04
		M1	0.6	250-350	0.93	0.05/0.05
				350-850	0.89	0.06/0.04
		M2	0.8	250-350	0.89	0.08/0.04
				350-850	0.84	0.05/0.05
		T	0.9	250-350	0.82	0.05/0.07
				350-850	0.76	0.05/0.06
DDBvL - DeepDoubleB tagger pfMassIndependentDeepDoubleBvLJetTags:probHbb		L	0.7	250-350	0.97	0.04/0.05
				350-850	0.96	0.07/0.06
		M1	0.86	250-350	0.81	0.07/0.05
				350-850	0.76	0.06/0.05
		M2	0.89	250-350	0.74	0.06/0.05
				350-850	0.70	0.07/0.06
		T1	0.91	250-350	0.65	0.07/0.05
				350-850	0.67	0.10/0.05
		T2	0.92	250-350	0.61	0.05/0.05
				350-850	0.69	0.07/0.09
DDBvLV2 - DeepDoubleBv2 tagger pfMassIndependentDeepDoubleBvLV2JetTags:probHbb		T	0.64	450-Inf	1.06	0.06/0.06
DDCvLV2 - DeepDoubleCv2 tagger pfMassIndependentDeepDoubleCvLV2JetTags:probHcc		T	0.45	450-Inf	0.94	0.10/0.09

Considered systematics include JES, PU, JP calib, b-frag, c-frag, cd-frag, K0L, fraction of gluonsplitting to bb/cc and tempalte morphing uncertainties

Cutflow Boosted Signal Region

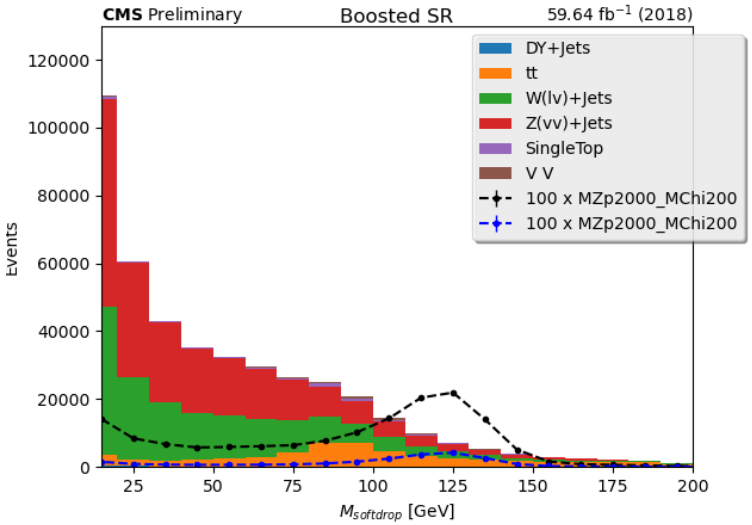
Mass[Z', χ] = [1000, 100], [2000, 200] GeV
σ = 0.2077pb, 0.01413pb

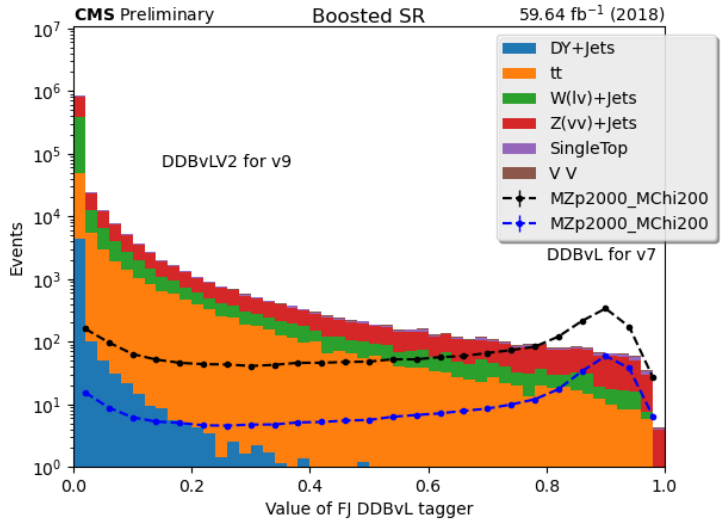


Bin	Selection	Total Bkg	Signal1	Signal2	$S1/\sqrt{S1+B}$	$S2/\sqrt{S2+B}$
0	NoCut	1.94e+08	12228.75	831.93	0.88	0.06
1	MET-Trigger	1.69e+07	6038.52	561.95	1.47	0.14
2	MET-Filter	1.69e+07	6038.52	561.95	1.47	0.14
3	$N_{tau} = 0$	1.69e+07	5972.13	556.67	1.45	0.14
4	$N_{\gamma} = 0$	1.68e+07	5931.99	551.97	1.45	0.13
5	$N_{e/\mu} = 0$	9.21e+06	5851.54	544.79	1.93	0.18
6	$p_T^{miss} > 250$GeV	1.16e+06	2673.52	355.86	2.48	0.33
7	N(FatJet)=1	9.11e+05	2090.75	293.89	2.19	0.31
8	$70 < M_{softdrop} < 150$GeV	1.13e+05	1000.85	171.71	2.97	0.51
9	FJ(DDBvL)>0.86	1.26e+01	573.58	108.89	23.69	9.88

FatJet selections: $p_T > 200$, $|\eta| < 2.5$, tight jetId, $\Delta R(e/\mu, FatJet) > 0.8$

FatJet: After N(FatJet)=1 selection (bin7)

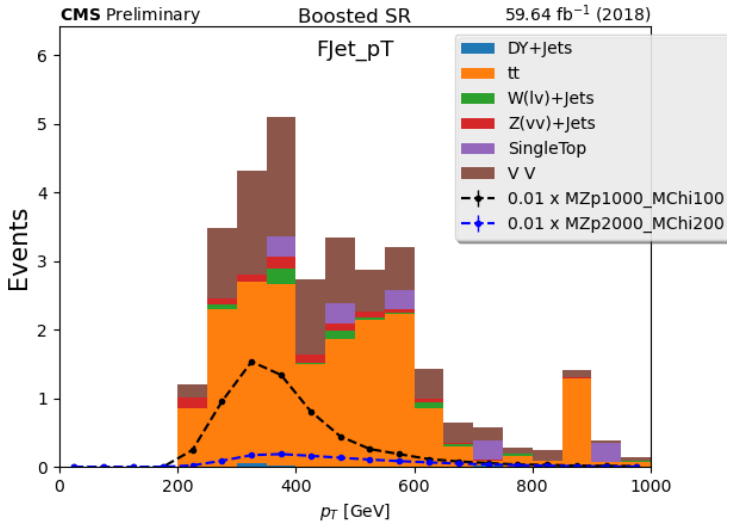


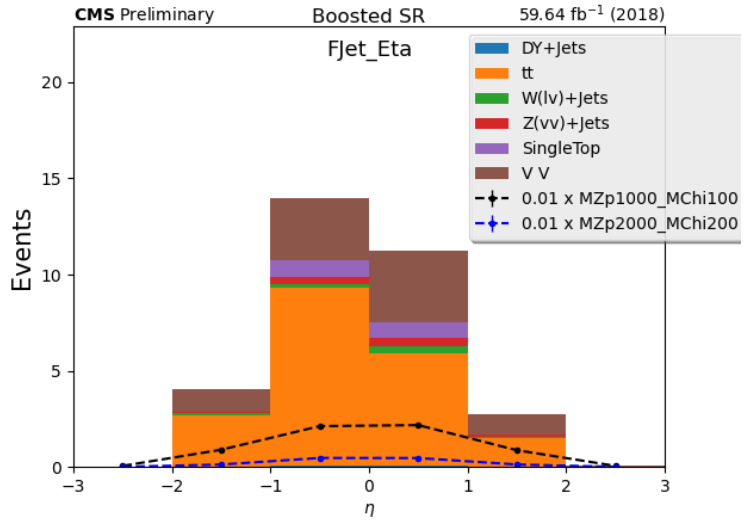


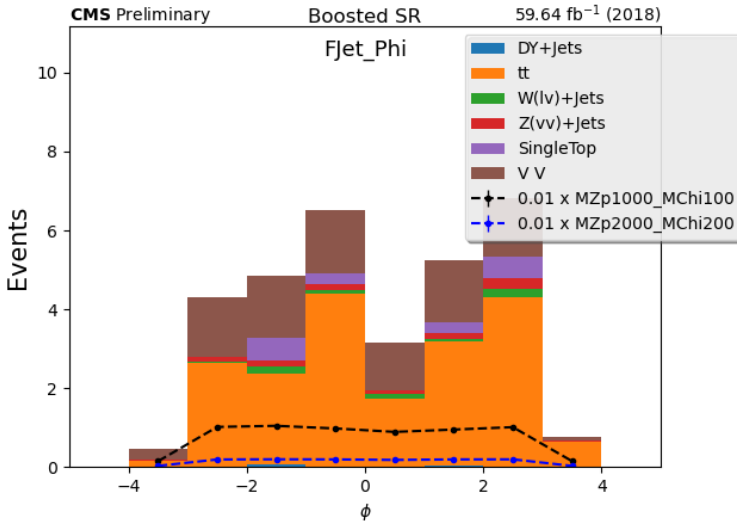
- $M_{softdrop}$: [70, 150] GeV

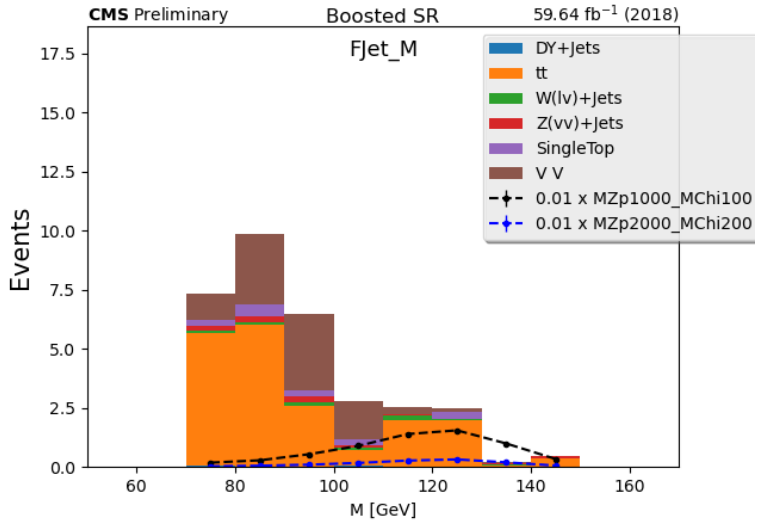
- DDBvL >0.86 for nanoaod-v7
- DDBvLV2 >0.86 for nanoaod-v9

FatJet kinematics: Boosted SR

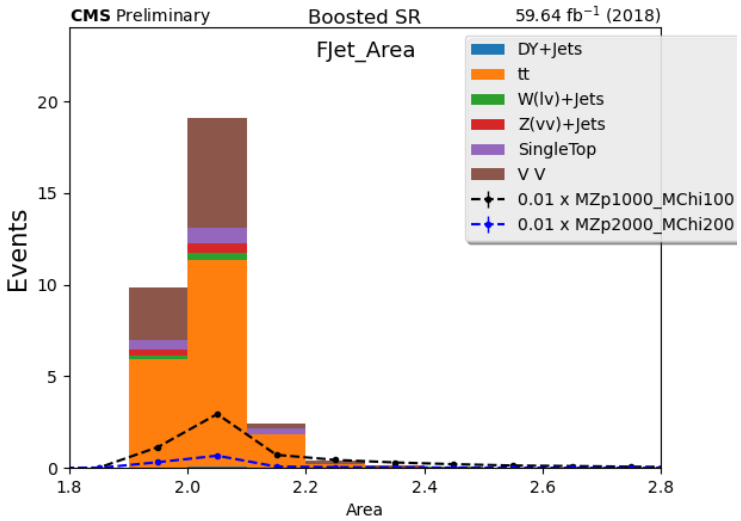


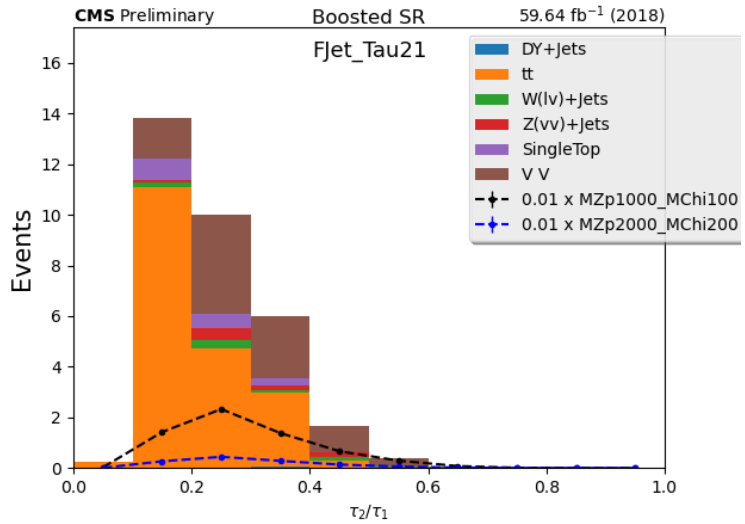






FatJet kinematics: Boosted SR





MET: Boosted SR