Cutflow challenge
Higgs tagger

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Cutflow challenge (MC)

Group	Stony Brook	Shandong U. (Remi)	MPI (Ilona)
Last update	19.11.2015	20.11.2015	20.11.2015
Remarks	CxAOD Code		CxAOD Reader
D0: All events (DxAOD)			
D1: pass GRL			
D2: has PV			
D3: is CleanEvent		**Rely on CxAOD**	
D4: pass jet cleaning			
D5: pass lepton pre-selection			
D6': pass jet pre-selection			
D6": pass fat-jet pre-selection			
D6: pass D6' || D6"			
C0: All Events (CxAOD)	19180	19180	19180
C1: Pass trigger && trigger matching	17052	17091	17092
C2: Lepton preselection (1 VHLooseLepton, == 1 WHSignalLepton)	17052	17091	17092
C3: MET > 30 GeV	16793	16830	16831
C4: mT(W) > 20 GeV	13692	13721	13722
C5: pT(W) > 120 GeV	13683	13712	13713
C6: >= 2 jets (sig&fwg)	10864	10899	10907
C7: >= 2 sig jets	10321	10346	10368
C8: |minΔφ(MET,j1,j2,j3)| > 1	6560	6574	6588
C9: >= 1 b-tagged jet	3329	6574	3348
C10: == 2 b-tagged jets	450	450	453
C11: pT(leading b-jet) > 45 GeV	450	450	453
C12': 95 < m(bb) < 140 before b-jet corr.	352	362	355
C12: 95 < m(bb) < 140 after OneMuon correction	357	361	-
C13: == 2 jets (sig+fwd) - continue from C12 (corrected mbb)	177	183	177
C14: == 3 jets (sig+fwd)	108	108	109
C15: == 4 jets (sig+fwd)	47	50	48
C16: >= 5 jets (sig+fwd)	20	21	21

Cutflow challenge (data)

Group	Stony Brook	MPI (Ilona)
Last update	19.11.2015	20.11.2015
Remarks	CxAOD Code	CxAOD Reader
D0: All events (DxAOD)		
D1: pass GRL		
D2: has PV		
D3: is CleanEvent		
D4: pass jet cleaning	**Rely on CxAOD**	
D5: pass lepton pre-selection		
D6': pass jet pre-selection		
D6'': pass fat-jet pre-selection		
D6: pass D6' || D6''		
C0: All Events (CxAOD)	810808	818221
C1: Pass trigger && trigger matching	562170	567933
C2: Lepton preselection (1 VHLooseLepton, == 1 WHSignalLepton)	562170	567933
C3: MET > 30 GeV	282019	282409
C4: mT(W) > 20 GeV	265237	264936
C5: pT(W) > 120 GeV	14307	14302
C6: >= 2 jets (sig&fwg)	11905	11909
C7: >= 2 sig jets	11171	11188
C8: |minΔφ(MET,j1,j2,j3)| > 1	7535	7561
C9: >= 1 b-tagged jet	1411	1388
C10: == 2 b-tagged jets	155	154
C11: pT(leading b-jet) > 45 GeV	153	152
C12': 95 < m(bb) < 140 before b-jet corr.	33	35
C12: 95 < m(bb) < 140 after OneMuon correction	31	
C13: == 2 jets (sig+fwd) - continue from C12 (corrected mbb)	2	2
C14: == 3 jets (sig+fwd)	8	8
C15: == 4 jets (sig+fwd)	11	12
C16: >= 5 jets (sig+fwd)	12	13

Low p_T?

Cutflow challenge (MC old)

Group	Stony Brook	MPI (Felix)	Osaka (Yohei)	Shandong U. (Yanhui)	Osaka (Naoki)	MPI (Ilona)
Last update	18.11.2015	17.11.2015	16.11.2015	17.11.2015	17.11.2015	18.11.2015
Remarks	-CxAOD code, fixed a mistake in C18-C20, using v14-05 CxAODs	- C0-3 from Maker cutflow - C4: private python code - results preliminary - OR missing	-private code independent from CxAOD based on AnalysisRelease		-C0-3 Maker 16-02 -C4~ based on Reader 16-0	CxAOD Reader
C0: All Events (DxAOD)		24227	24227		24227	
C1: Preselection event cleaning (GRL, CleanEvent, JetCleaning)		24116	24220		24220	
C2: Lepton preselection (1 VHLooseLepton, == 1 WHSignalLepton)		19161	19280		19280	
C3: Jet preselection || fatjet preselection		19157	19276		19276	
C3': All Events (CxAOD)	19180	19286	not using CxAOD	19180	19278	19180
C4: N(loose lept) = 1 && N(sig lept) = 1		19276	19276	17410	19278	19180
C5: >= 2 jets (sig&fwg)		15368	15350	13834	15351	15273
C6: >= sig jets		14607	14585	13140	14587	14511
C7: Pass trigger		13272	13237	13140	13134	13194
C8: Trigger matching	12874	13011	12977	12874	12977	12936
C9: MET > 30 GeV	12682	12813	12783	12682	12783	12740
C10: mT(W) > 20 GeV	10329	10438	10401	10329	10400	10376
C11: pT(W) > 120 GeV	10321	10430	10393	10321	10392	10368
C12: $\|min\Delta\varphi(MET,j1,j2,j3)\| > 1$	6560	6596	6613	6560	6603	6588
C13: >= 1 b-tagged jet	3329	3811	3822	3771	3804	3245
C14: == 2 b-tagged jets	450	652	658	646	656	647
C15: pT(leading b-jet) > 45 GeV	450	648	658	646	656	647
C16: 95 < m(bb) < 140 before b-jet corr.	352	364	368	479	366	481
C16': 95 < m(bb) < 140 after OneMuon correction	357	369	357		369	
C17: == 2 jets (sig+fwd) - continue from C16	177	177	179	177	179	177
C18: == 3 jets (sig+fwd)	108	113	115	146	115	147
C19: == 4 jets (sig+fwd)	47	54	54	95	52	96
C20: >= 5 jets (sig+fwd)	20	20	20	61	20	61

python result
in good shape

Cutflow challenge (data old)

Group	Stony Brook	MPI (Felix)	Osaka (Yohei)	Shandong U. (Yanhui)
Last update	18.11.2015	17.11.2015	16.11.2015	17.11.2015
Remarks	CxAOD Reader (Nov10), fixed a mistake in C18-C20, using v14-05 CxAODs	- C0-3 from Maker cutflow - C4: private python code - results preliminary - OR missing	-private code independent from CxAOD based on AnalysisRelease	
C0: All Events (DxAOD)		3610962	3610962	
C1: Preselection event cleaning (GRL, CleanEvent, JetCleaning)		3517502	3552179	
C2: Lepton preselection (1 VHLooseLepton, == 1 WHSignalLepton)		1322091	1352025	
C3: Jet preselection || fatjet preselection		818240	838298	
C3': All Events (CxAOD)	810808	818240	not using CxAOD	810815
C4: N(loose lept) = 1 && N(sig lept) = 1		818240	838298	604101
C5: >= 2 jets (sig&fwg)		366373	375739	274289
C6: >= sig jets		320128	328165	239947
C7: Pass trigger		230282	247478	239947
C8: Trigger matching	224591	229370	247137	224591
C9: MET > 30 GeV	122502	124197	132783	122502
C10: mT(W) > 20 GeV	111736	112925	120292	111736
C11: pT(W) > 120 GeV	11171	11188	11527	11171
C12: |minΔφ(MET,j1,j2,j3)| > 1	7535	7561	7766	7535
C13: >= 1 b-tagged jet	1411	1914	1990	1880
C14: == 2 b-tagged jets	155	574	599	575
C15: pT(leading b-jet) > 45 GeV	153	509	595	571
C16: 95 < m(bb) < 140 before b-jet corr.	33	143	162	148
C16': 95 < m(bb) < 140 after OneMuon correction	31	141	157	
C17: == 2 jets (sig+fwd) - continue from C16	2	2	2	2
C18: == 3 jets (sig+fwd)	8	22	29	27
C19: == 4 jets (sig+fwd)	11	40	43	38
C20: >= 5 jets (sig+fwd)	12	79	88	81

Hbb tagger

Hi Giordon,
I think I found the problem. It looks like a major bug in the way the tool runs, possibly only in the way it is compiled in AnalysisBase given that you don't see the problem.

I printed the list of track jets when the algorithm runs in the result() method after the btag counting, and in the get_bTagged_trackJets() method.
This is the list of track jets in the result() method for one jet which claims to pass the Loose working point (result=5):
pT=192109 eta=-0.46129 N=10 isB=1
pT=192109 eta=-0.46129 N=10 isB=1
pT=24507.3 eta=-0.0800836 N=4 isB=0
pT=22876.7 eta=-0.338772 N=2 isB=0
pT=12980.1 eta=-0.242515 N=3 isB=0
pT=7860.69 eta=-0.687618 N=2 isB=0
pT=2181.51 eta=-0.259547 N=1 isB=0

duplicate track jet
→ False positive Xbb decision!

and this is the list of the track jets in the get_bTagged_trackJets() method:
pT=22876.7 eta=-0.338772 N=2 isB=0
pT=4842.84 eta=-0.881134 N=1 isB=0
pT=24507.3 eta=-0.0800836 N=4 isB=0
pT=12980.1 eta=-0.242515 N=3 isB=0
pT=2181.51 eta=-0.259547 N=1 isB=0
pT=7860.69 eta=-0.687618 N=2 isB=0
pT=192109 eta=-0.46129 N=10 isB=1

In the first list there is a duplication of the first jet which is b-tagged. I scanned many events and it looks like this behaviour happens very often.
It looks like something is wrong with the pT ordering or the cleaning of the track jets that is done in the algorithm.

Jose

fat jets xbb tagging

h_fat_xbb_all_WH125	
Entries	2099
Mean	0
RMS	0
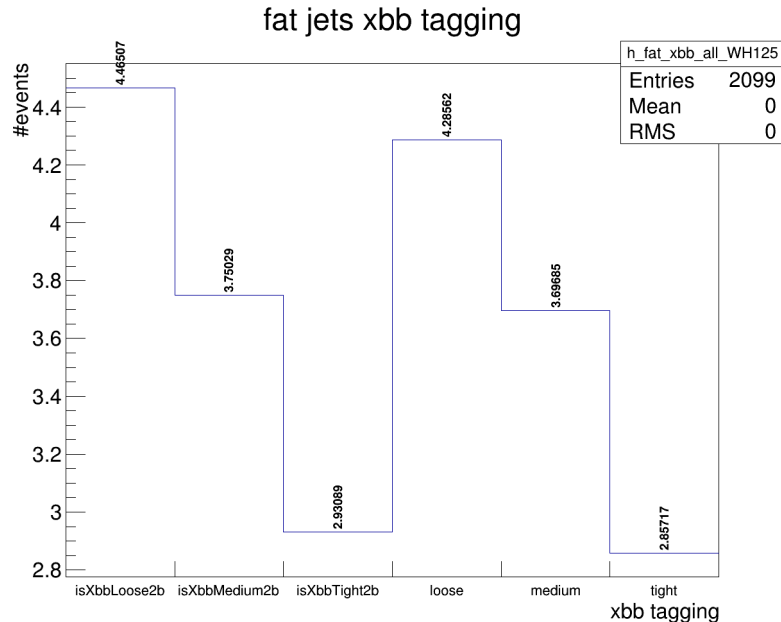
- Effect seen before in CxAOD
  - Assuming a problem with CxAOD track jets (another known issue at the time)
  - Not sure if python CxAOD Xbb tagging ok
- Bug confirmed by Jose Benitez
- All version up to date have been affected
- Fixed in version JetSubStructureUtils-00-02-18
- Tagged in version ASG release 2.3.35 (end of last week)