Comments

Hi Florencia,

It would be good to schedule a presentation at our next upgrade physics meeting. A few comments:

- Pflow has not been validated in Run 4 samples yet, so using pflow inputs is too premature without further studies. My suggestion for now is to use EMTopo jets, fully calibrated, and use tracks as inputs to compute substructure variables.

- A key element of any Run 4 study is track selection. In fact I see you use pt>0.5 GeV as in Run 2/3 but we only store tracks above 1 GeV in Run 4 in the central region. For the forward region you will need a cut on track time to reduce pileup contamination. Track impact parameter significance cuts are extremely important. My suggestion is that you require track z0 significance < 3 with respect to the primary vertex, and depending on what sample you are looking at, require that the reco vertex z is within 2mm of the truth z vertex.

- Please quantify the average of each input variable (as well as the tagger rejection at fixed efficiency) as a function of the vertex z density.

Best,
Ariel

No EMTopo Collection in JETM2

```
QGTaggingAlg          INFO Booking scale factor branches
QGTaggingAlg          INFO The following SF providers are available:
QGTaggingAlg          INFO   MCWeight
QGTaggingAlg          INFO Booking branches for EventInfo decorations
QGTaggingAlg          INFO Initializing output TTrees
QGTaggingAlg          INFO Booking output tree: NOMINAL
ApplicationMgr        INFO Application Manager Initialized successfully
ApplicationMgr        INFO Application Manager Started successfully
EventCutflowAlg       INFO Cut bookkeeper: AllExecutedEvents (0, StreamAOD) = 1000
EventCounter          INFO execute ==> seen events: 0
StoreGateSvc       WARNING retrieve(const): No valid proxy for object AntiKt4EMTopoJets  of type xAOD::IParticleCon
iner(CLID 1241842700)
JetFilter            ERROR AAC/src/ObjectFilterAlg_v2.cxx:127 (StatusCode AAC::ObjectFilterAlg_v2::execute()): code
AILURE: evtStore()->retrieve( particles , m_inputCollectionNames[syst.index])
JetFilter            ERROR Maximum number of errors ( 'ErrorMax':1) reached.
SubSequence           INFO execute of [JetFilter] did NOT succeed
SubSequence          ERROR Maximum number of errors ( 'ErrorMax':1) reached.
AthAlgSeq             INFO execute of [SubSequence] did NOT succeed
AthAlgSeq            ERROR Maximum number of errors ( 'ErrorMax':1) reached.
AthAllAlgSeq          INFO execute of [AthAlgSeq] did NOT succeed
AthAllAlgSeq         ERROR Maximum number of errors ( 'ErrorMax':1) reached.
AthAlgEvtSeq          INFO execute of [AthAllAlgSeq] did NOT succeed
AthAlgEvtSeq         ERROR Maximum number of errors ( 'ErrorMax':1) reached.
```

PHYSVAL DERIVATIONS

40308847 task: **user.fcastill.PHYSVAL_mc21_14TeV.801168.Py8EG_A14NNPDF23LO_jj_JZ3.recon.AOD.e8481_s4290_r15420/** aipanda191 | 07-16 08:29:40,Refresh

40308847 task

Task ID	Type	Processing type	User	Nucleus	Status	N input files finished	N input events used	N output events	HS23s Expected Total done failed	Time stamps: created last modified	Cores	Priority: original current	Attempt	CO_2 total done failed
40308847	analy	panda-client-1.5.76-jedi-athena-trf	Florencia Luciana Castillo	—	done	1,000 (100%) 1,000	1,000,000 (100%) 1,000,000	1,000,000	30.0M 17.9M 17.9M 0	2024-07-15 13:48:09 2024-07-15 17:41:13	1	1001 1000	0	765g 765g 0g

Task extra info | Show jobs | Task parameters and help | Memory & walltime usage | Other plots

States of jobs in this task [drop mode]

	pending	defined	waiting	assigned	throttled	activated	sent	starting	running	holding	transferring	merging	finished	failed	cancelled	closed
Build													4			
Run													1000			

Scout jobs:	cpuTime: 6270757885, 6270757887, 6270800269, 6270800282	walltime: 6270757887, 6270800211	ramCount: 6270757882, 6270757884, 6270798450, 6270798899	ioIntensity: 6270757888, 6270800494	outDiskCount: 6270757886, 6270757887, 6270798454, 6270799012

Reading EMTopo and Calibration

```
JVTFileName : JetMomentTools/JVTlikelihood_20140805.root

ToolSvc.JetVert...   INFO                        resolved in  :
    /cvmfs/atlas.cern.ch/repo/sw/software/25.2/AthAnalysis/25.2.3/InstallArea/x86_64-centos7-gcc11-opt/data/JetMome
tTools/JVTlikelihood_20140805.root


JetFilter            INFO Initializing JetFilter...
JetFilter            INFO Selection string: pt
JetFilter            INFO Selection string: eta
JetFilter            INFO Selection string: eta
JetFilter            INFO Using CalibAntiKt4EMTopoJetsas the source collection
JetFilter            INFO Using Jet20CalibAntiKt4EMTopoJetsas the output collection
JetFilter            INFO Events selection:
EventCutflowAlg      INFO Initializing EventCutflowAlg...
EventCutflowAlg      INFO Events selection:
EventCutflowAlg      INFO +=======================================
EventCutflowAlg      INFO | BEGINNING OF EventCutflowAlg
EventCutflowAlg      INFO +=======================================
QGTaggingSelect...   INFO Initializing QGTaggingSelectionAlg...
QGTaggingAlg         INFO Initializing QGTaggingAlg...
QGTaggingAlg         INFO Booking scale factor branches
QGTaggingAlg         INFO The following SF providers are available:
```

HGTD

```
Track properties
vector<int>     *InDetTrackParticlesAuxDyn_truthOrigin;
vector<int>     *InDetTrackParticlesAuxDyn_truthType;
Int_t           InDetTrackParticlesAuxDyn_truthParticleLink_;
vector<float>   *InDetTrackParticlesAuxDyn_truthMatchProbability;
vector<vector<bool> > *InDetTrackParticlesAuxDyn_HGTD_cluster_merged;
vector<vector<float> > *InDetTrackParticlesAuxDyn_HGTD_cluster_raw_time;
vector<vector<bool> > *InDetTrackParticlesAuxDyn_HGTD_cluster_shadowed;
vector<vector<float> > *InDetTrackParticlesAuxDyn_HGTD_cluster_time;
vector<vector<int> > *InDetTrackParticlesAuxDyn_HGTD_cluster_truth_class;
vector<vector<float> > *InDetTrackParticlesAuxDyn_HGTD_extension_chi2;
vector<float>   *InDetTrackParticlesAuxDyn_HGTD_extrap_x;
vector<float>   *InDetTrackParticlesAuxDyn_HGTD_extrap_y;
vector<vector<bool> > *InDetTrackParticlesAuxDyn_HGTD_has_extension;
vector<vector<bool> > *InDetTrackParticlesAuxDyn_HGTD_primary_expected;
vector<unsigned int> *InDetTrackParticlesAuxDyn_HGTD_summaryinfo;
vector<int>     *InDetTrackParticlesAuxDyn_nBC_meas;
vector<float>   *InDetTrackParticlesAuxDyn_time;
vector<float>   *InDetTrackParticlesAuxDyn_timeres;
```