Preparation for Week 1

Laurie McClymont

29/05/15

Aims

- First data available in Week 1 (Next Week!)

- We want to look at this data and see if the b-Tagging variables are performing as expected.

Process

- Valerio Produces NTuples using Run2BtagOptimisationFramework.

- I have code that reads the NTuples and fills histograms with quantities from the NTuples.

- Code takes ~10 mins to run over NTuples.

Samples and Cuts

Samples

```
user.vdao.mc15_13TeV.*.Pythia8EvtGen_jetjet_JZ*W
.merge.AOD.*.BTAGNTUP_OrigV5slim_BTAGSTREAM/
```

- A week 1 dijet sample for comparison to data.

- 1,962,675 events split into 10 JZ slices each containing ~200,000 events.

- Not using JZ0W sample.

- JZ slices must be re-weighted to get smooth jet-P_T spectrum.

Details/Cuts

1 Jet Case

- njets ≥ 1
- Leading Jet Only

- 20 < P_T < 4600 GeV
- |eta| < 2.5
- JVT > 0.5

- LabDr_HadF truth matching.
- AntiKt4EMTopoJets

2 Jet Case

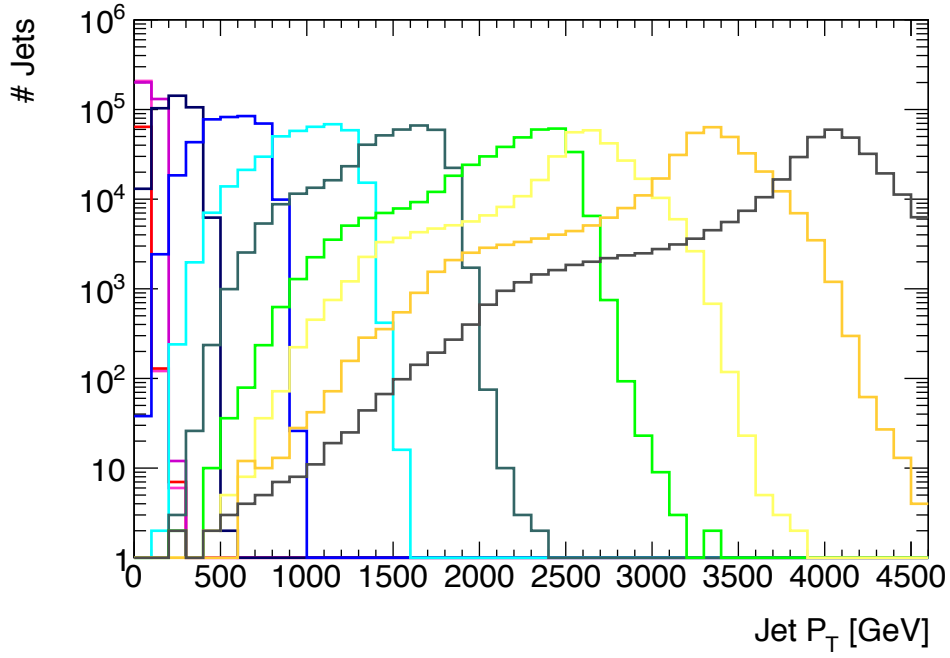
- njets ≥ 2
- Leading and Sub-Leading Jet Only

- 20 < P_T < 4600 GeV
- |eta| < 2.5
- JVT > 0.5

- LabDr_HadF truth matching.
- AntiKt4EMTopoJets

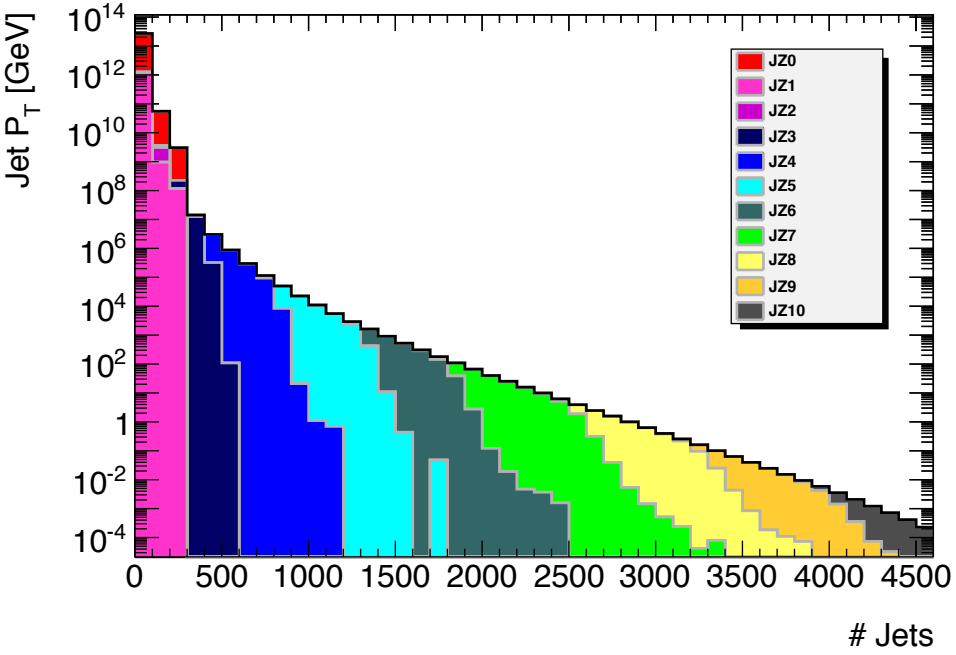
Di-jet sample re-weighting

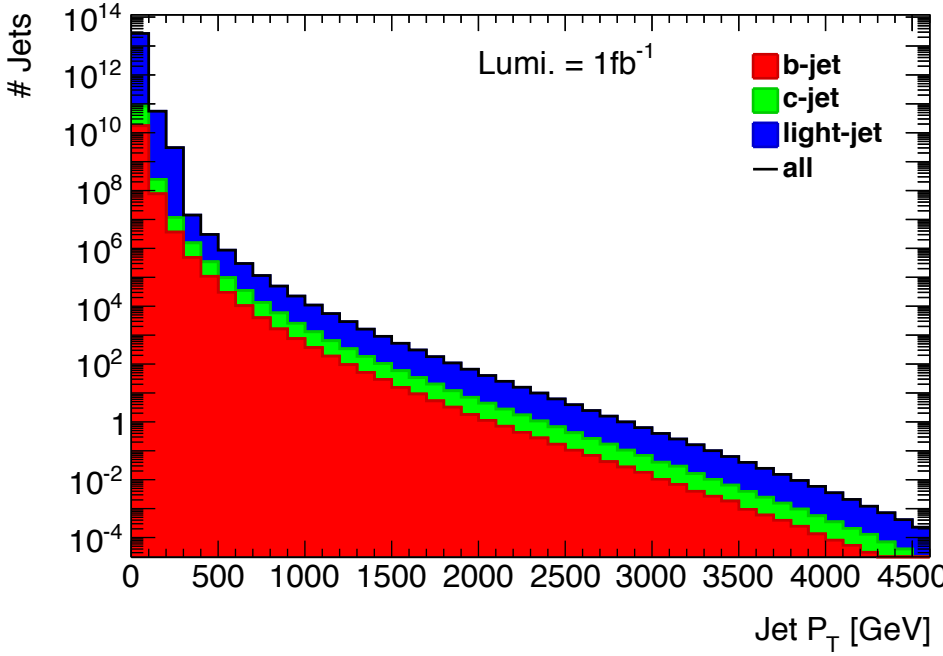
1 Jet Case



Total Weight = mcwg*(Filter Eff.)*(CS[fb])*(Lumi[fb^{-1}]) / (# Events)

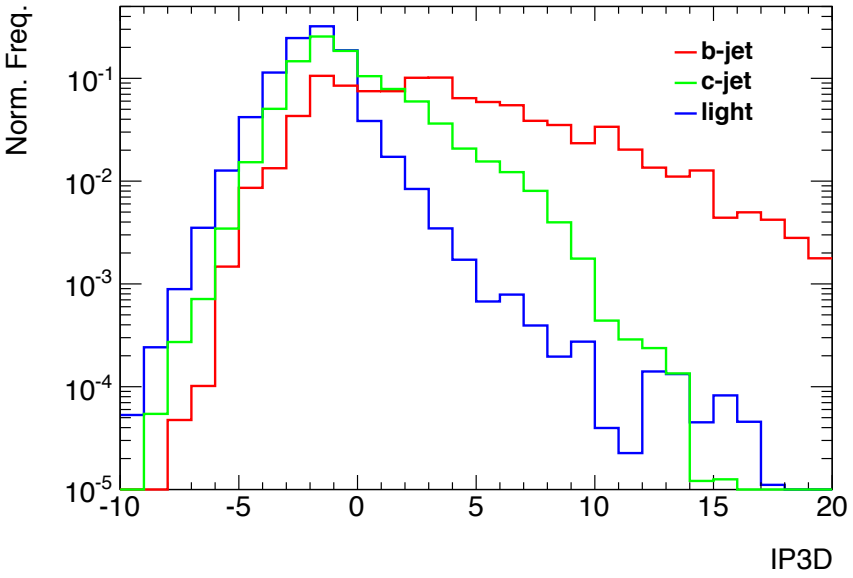
Xs(fb)	Eff.	Slice and Energy
~~7.8420E+13~~	~~1.0240E+00~~	~~#JZ0W 0-20 GeV~~
7.8420E+13	6.7198E-04	#JZ1W 20-60 GeV
2.4334E+12	3.3264E-04	#JZ2W 60-160 GeV
2.6454E+10	3.1953E-04	#JZ3W 160-400 GeV
2.5464E+08	5.3009E-04	#JZ4W 400-800 GeV
4.5536E+06	9.2325E-04	#JZ5W 800-1300 GeV
2.5752E+05	9.4016E-04	#JZ6W 1300-1800 GeV
1.6214E+04	3.9282E-04	#JZ7W 1800-2500 GeV
6.2505E+02	1.0162E-02	#JZ8W 2500-3200 GeV
1.9640E+01	1.2054E-02	#JZ9W 3200-3900 GeV
1.1961E+00	5.8935E-03	#JZ10W 3900-4600 GeV

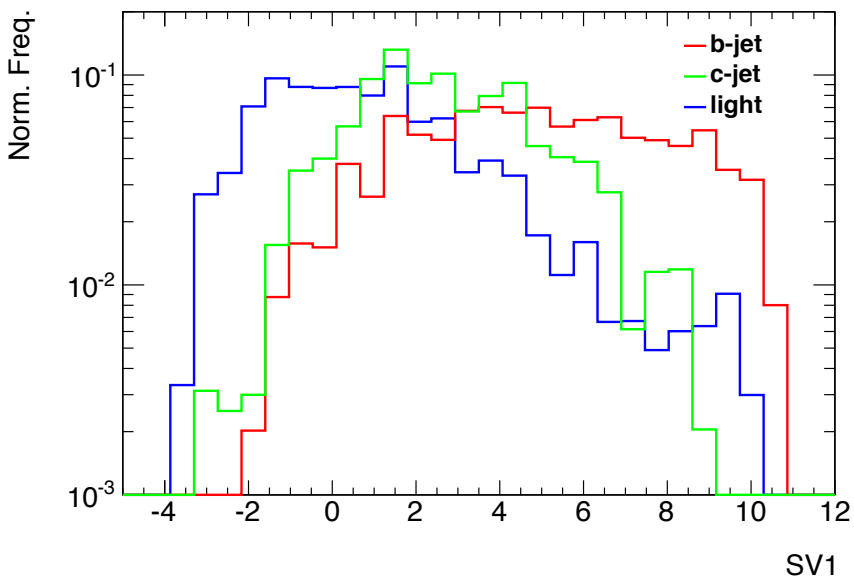


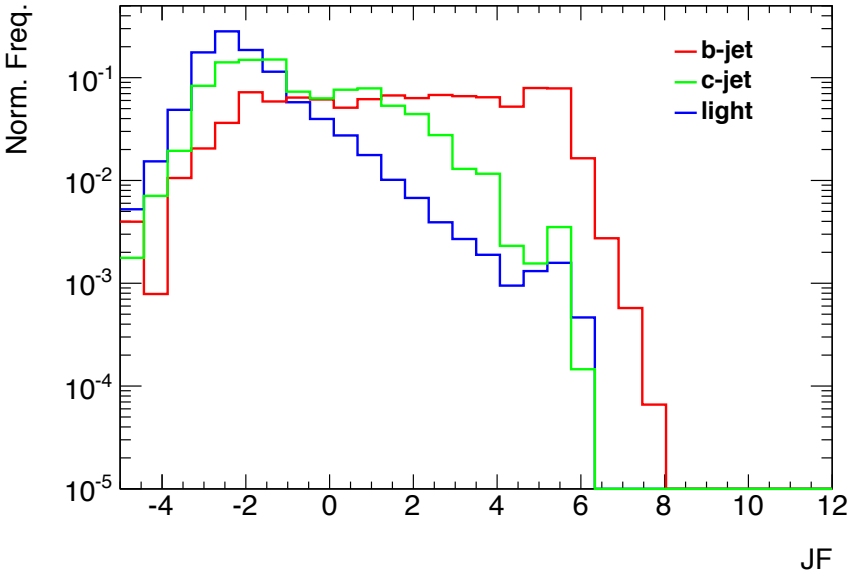


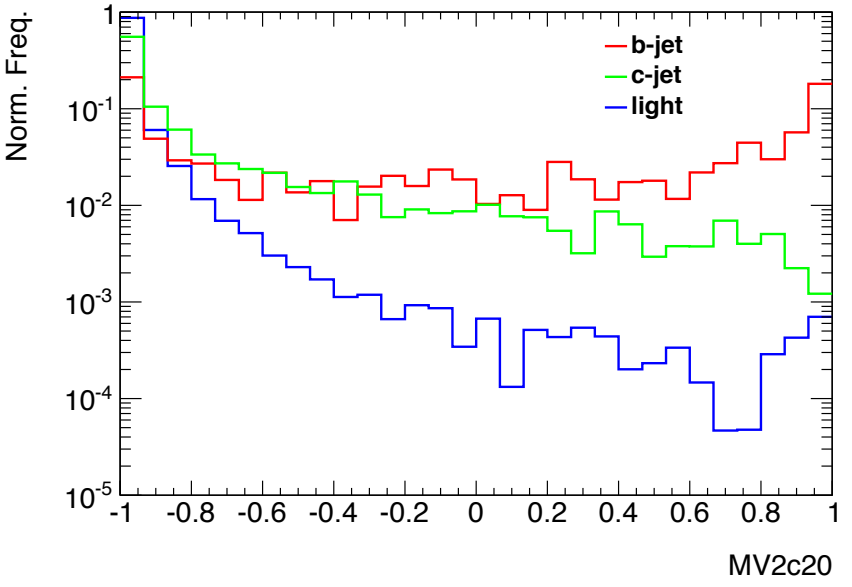
Normalised Discriminant - 1 Jet Case

1 Jet Case njets ≥ 1 Leading Jet Only



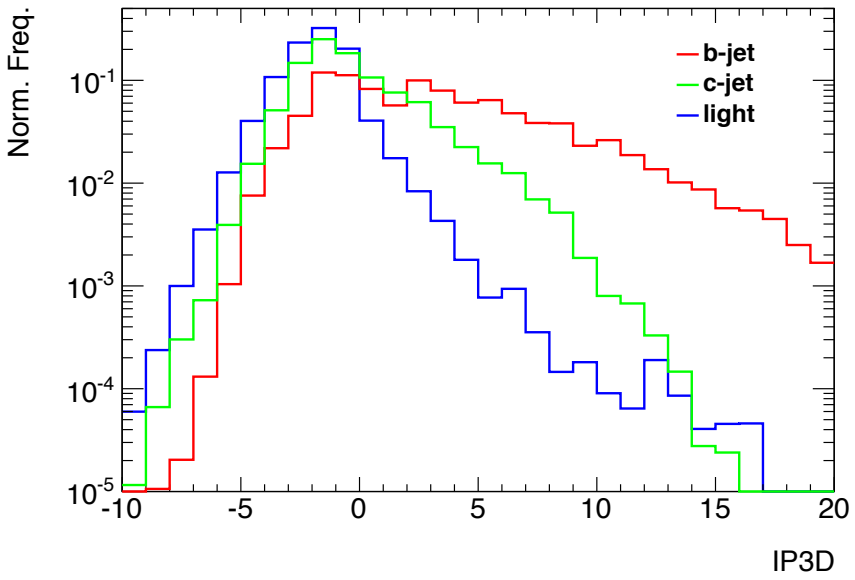


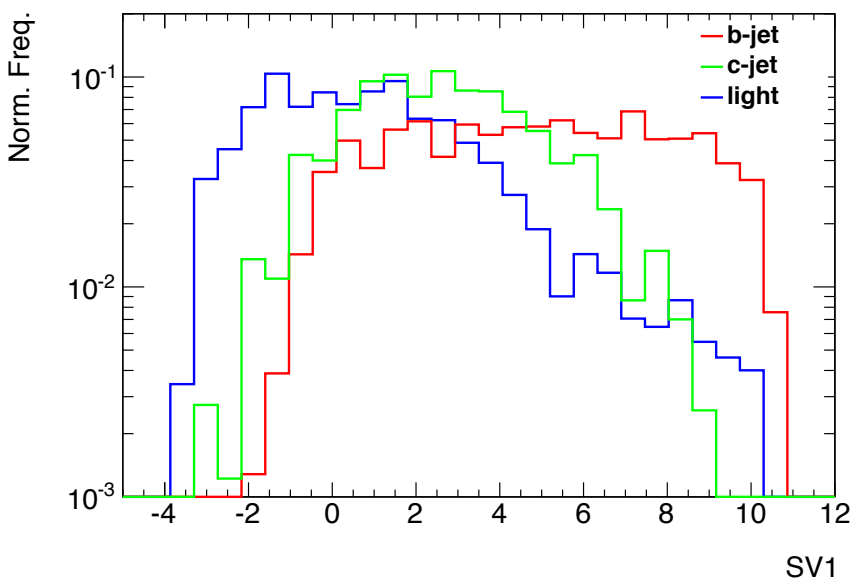


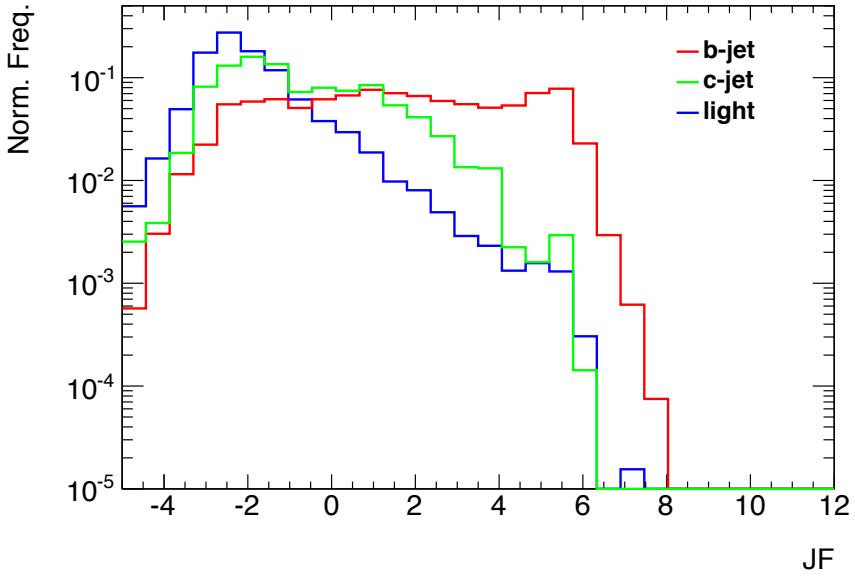


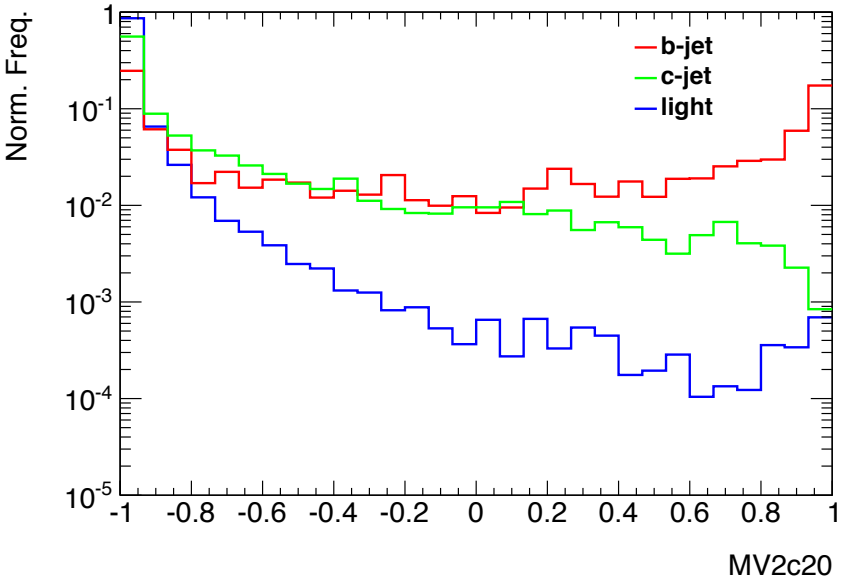
Normalised Discriminant - 2 Jet Case

2 Jet Case njets ≥ 2 Leading and Sub-Leading Jet Only



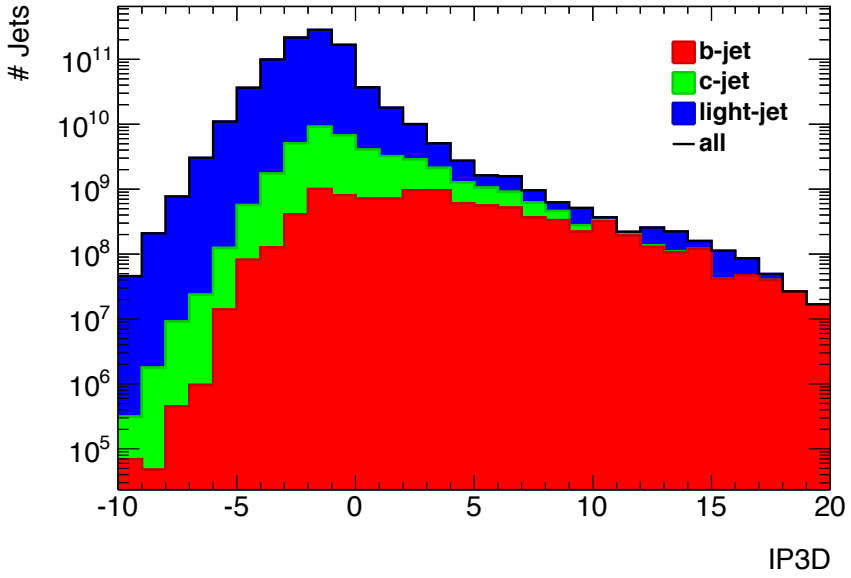


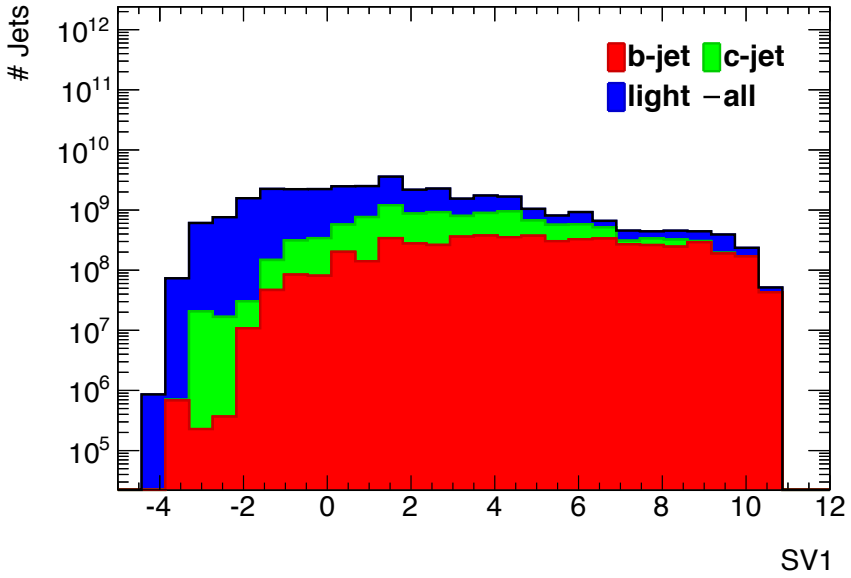


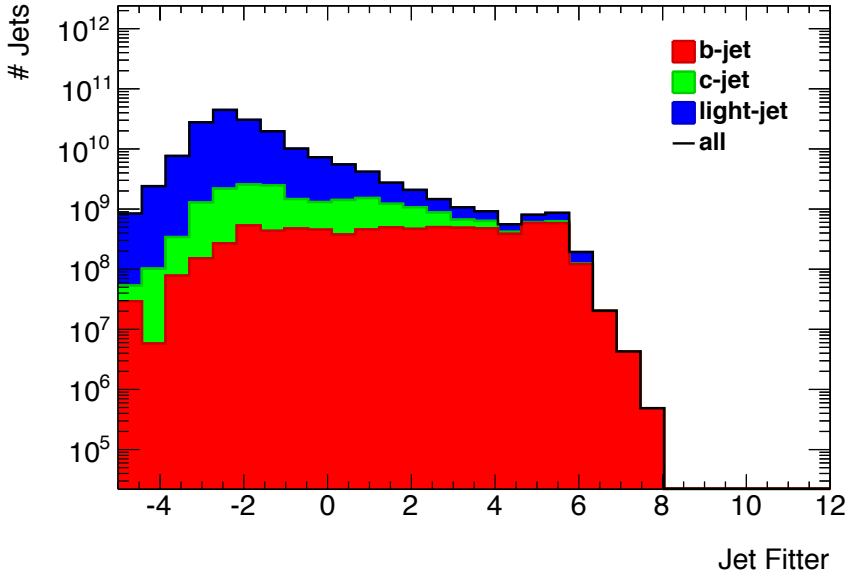


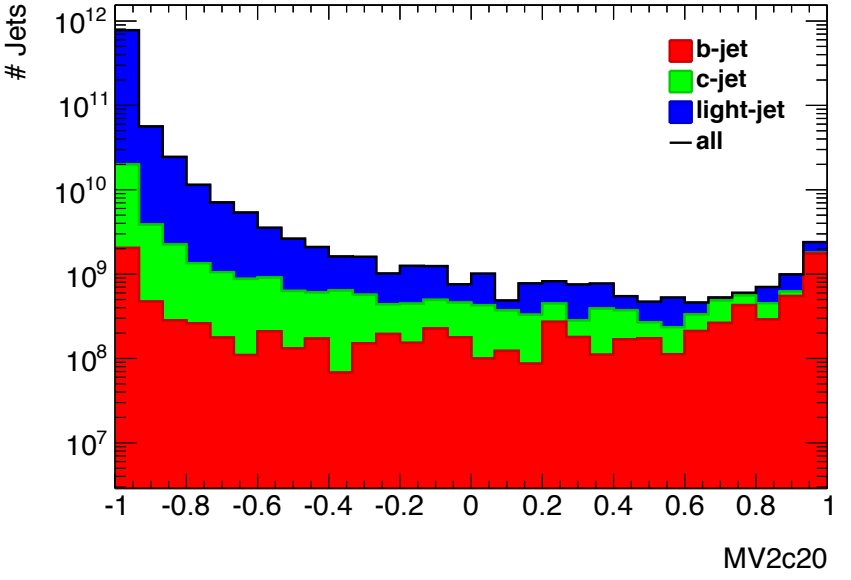
Discriminant Stack - 1 Jet Case

1 Jet Case njets ≥ 1 Leading Jet Only



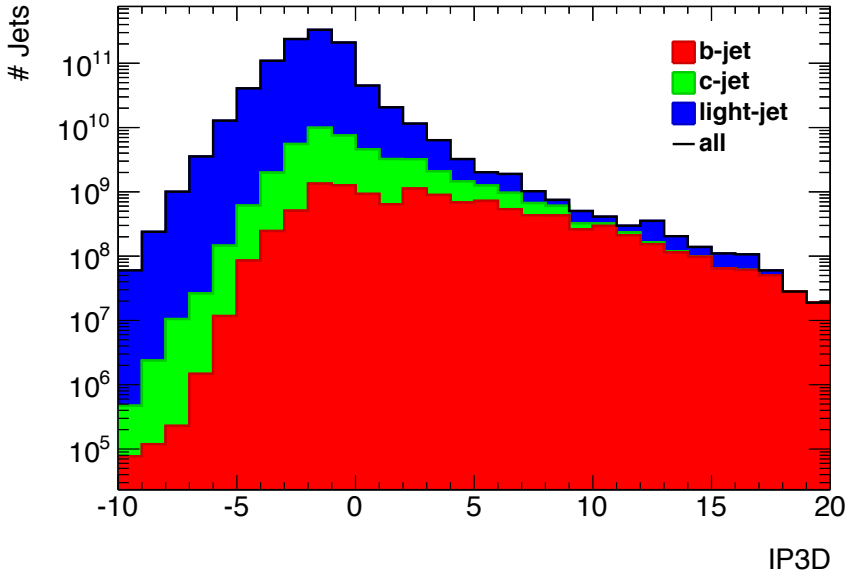


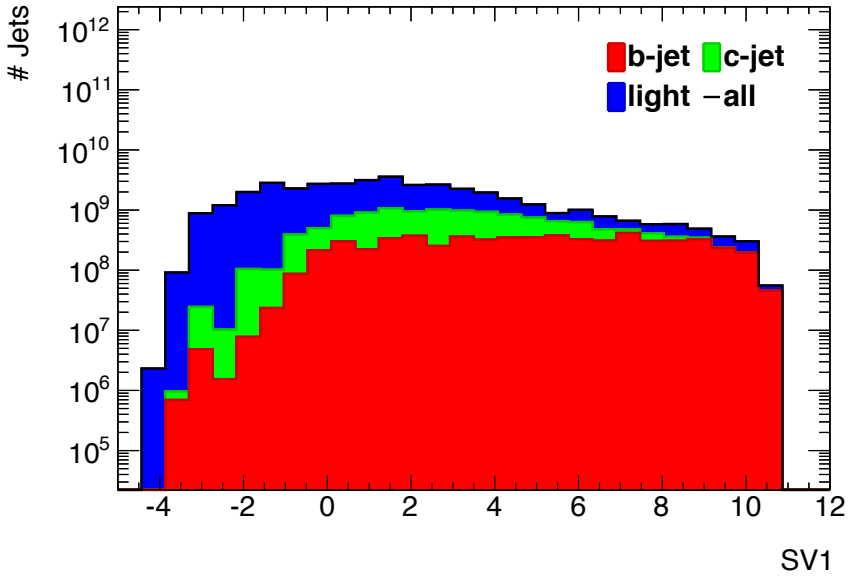


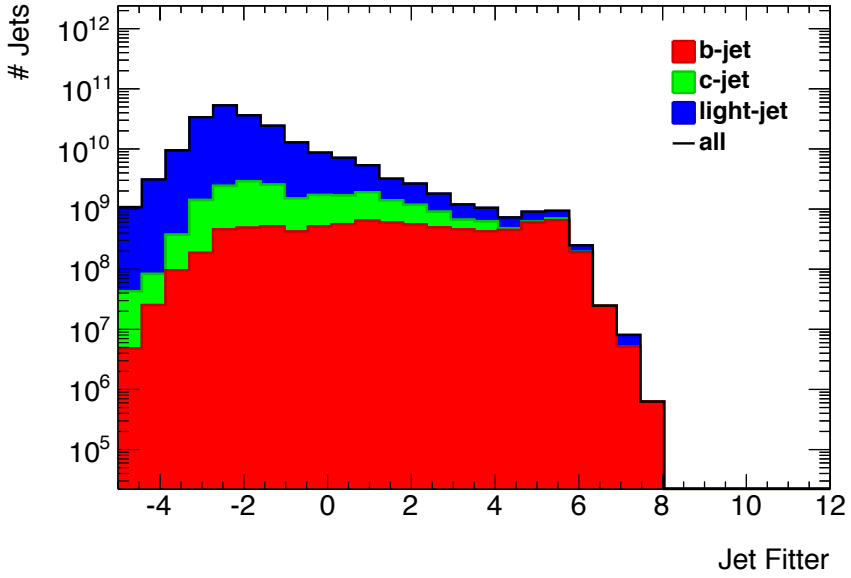


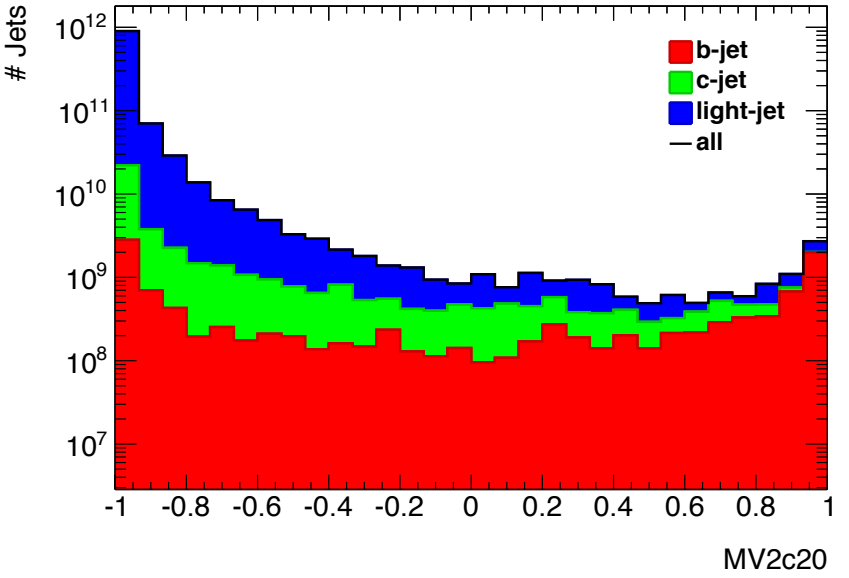
Discriminant Stack - 2 Jet Case

2 Jet Case njets ≥ 2 Leading and Sub-Leading Jet Only



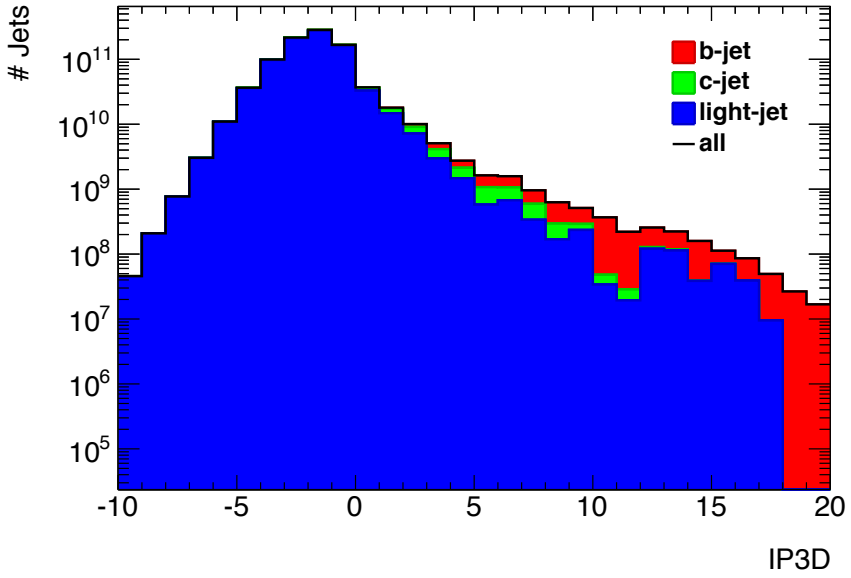


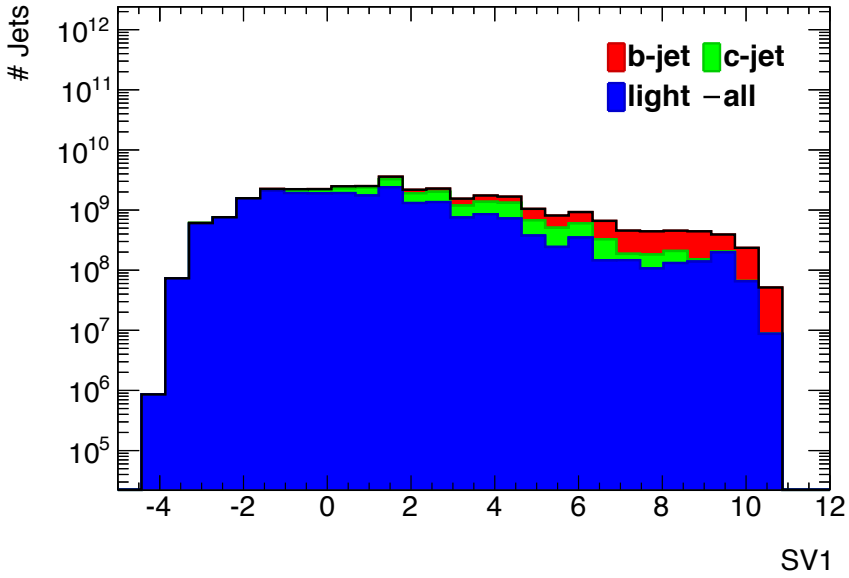


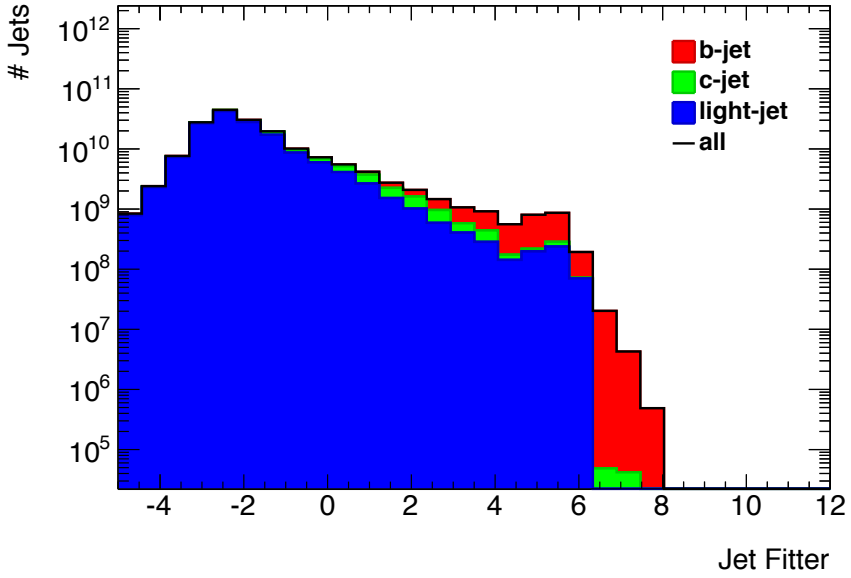


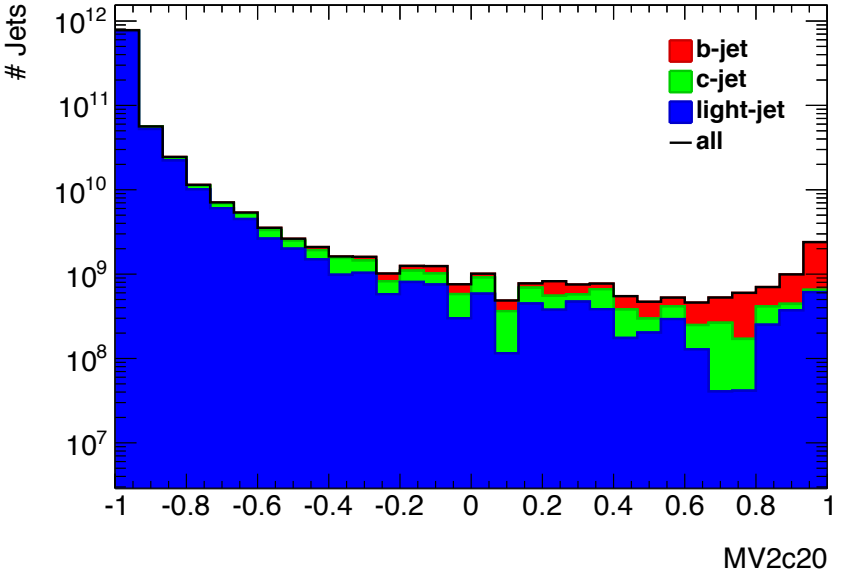
Reversed Stack - 1 Jet Case

1 Jet Case njets ≥ 1 Leading Jet Only



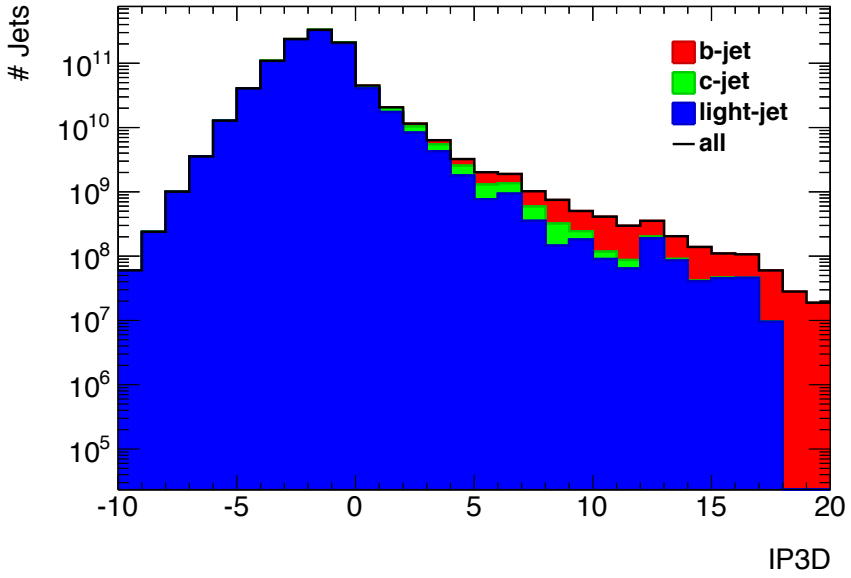


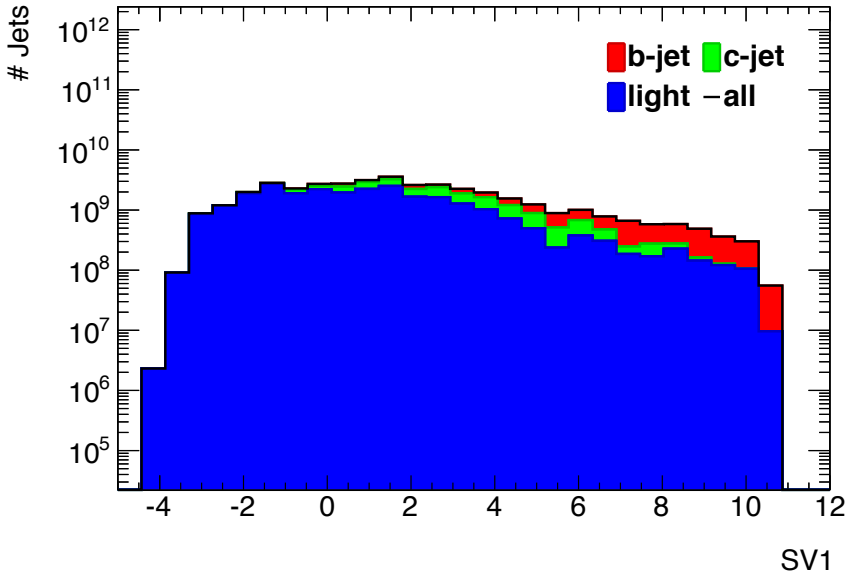


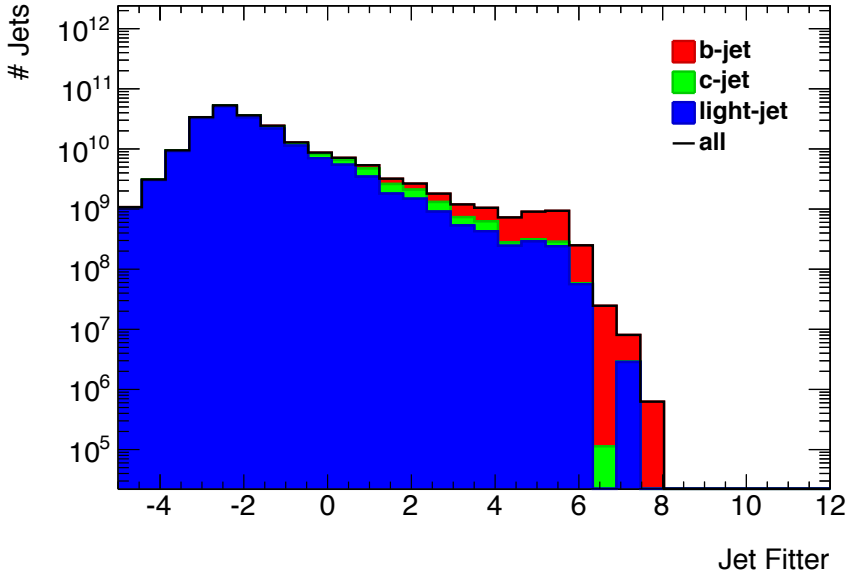


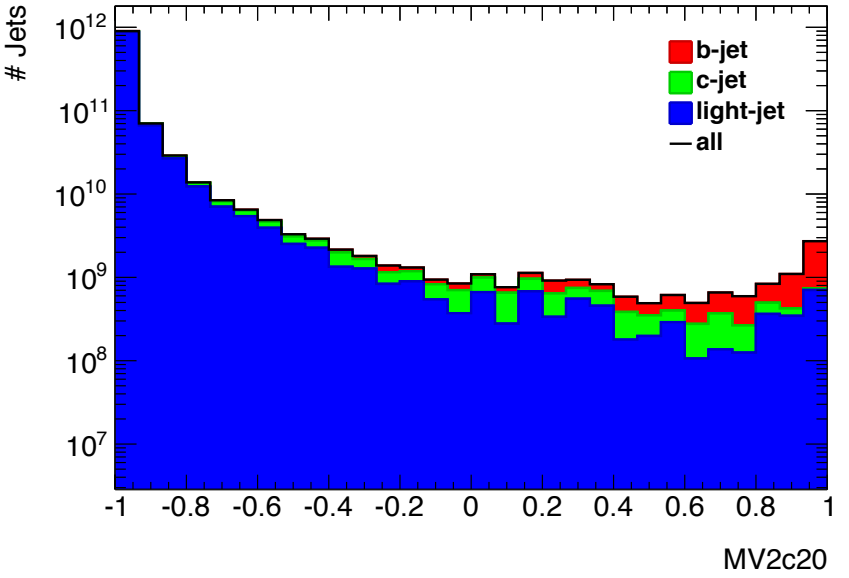
Reversed Stack - 2 Jet Case

2 Jet Case njets ≥ 2 Leading and Sub-Leading Jet Only









To Do

• Just a few thoughts, please add to this list...

• Look at data NTuple.
- Add to plots for comparison.
- Identify high MV2c20 event that is cleanly constructed.

• Improve look for comparison.
- Normalise stacks to # of jets/events? This should allow for better comparison between the distributions and then when data is introduced

• Other distributions...
- nPVz?
- avgmu?
- JVT?