

Status report

Mar 4, 2021

Jieun Choi

HYU / IP2I

True Tprime

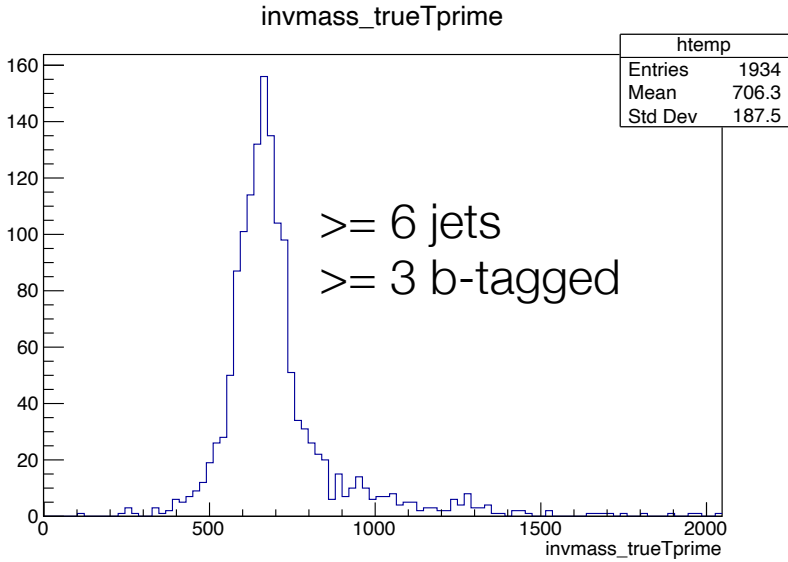
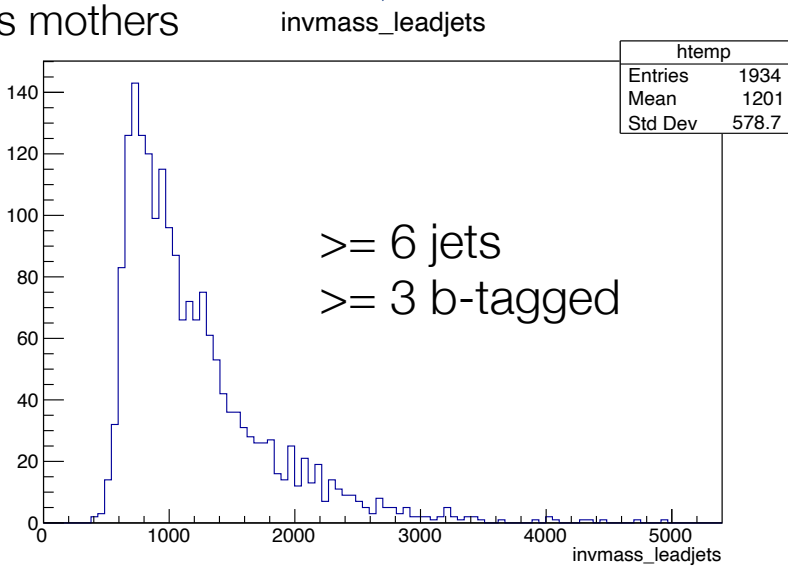
Tracking true Tprime from nanoAOD

- Find particle which is not lepton, and has top/Higgs in its mothers
- If it has top/Higgs, look up the Tprime in its mothers
- Matching the genParticle with genJet, if minDR < 0.4
- Matching the Jet with genJet, (Jet_genJetIdx)

```
root [6] Events->Scan("Jet_pt:Jet_genJetIdx:GenJet_pt")
*****
*      Row      * Instance *      Jet_pt * Jet_genJe * GenJet_pt *
*****
*      0      *      0      * 120.4375 *      0      * 116.71450 *
*      0      *      1      *   84.25  *      1      *  90.457222 *
*      0      *      2      *   76.0625 *      2      *  65.974769 *
*      0      *      3      *   72.6875 *      3      *  60.032177 *
*      0      *      4      *   54.03125 *      4      *  52.556812 *
*      0      *      5      *   31.015625 *      6      *  29.301639 *
*      0      *      6      *   25.859375 *      7      *  28.415885 *
*      0      *      7      *   16.125  *      8      *  25.966417 *
*      0      *      8      *           *           *  14.779829 *
*      1      *      0      *   81.6875 *      0      * 105.7864  *
*      1      *      1      *   49.34375 *      1      *  49.604560 *
*      1      *      2      *   39.28125 *      3      *  38.700149 *
*      1      *      3      *   29.4375  *      4      *  31.123186 *
*      1      *      4      *   28.4375  *      2      *  25.862447 *
*      1      *      5      *   22.234375 *      6      *  22.249050 *
*      1      *      6      *   21.453125 *      5      *  20.936103 *
*      1      *      7      *   20.3125  *      7      *  19.073207 *
*      1      *      8      *   20.265625 *      9      *  15.719570 *
*      1      *      9      *   16.015625 *      8      *  15.316276 *
*      1      *     10      *           *           *  10.435597 *
```

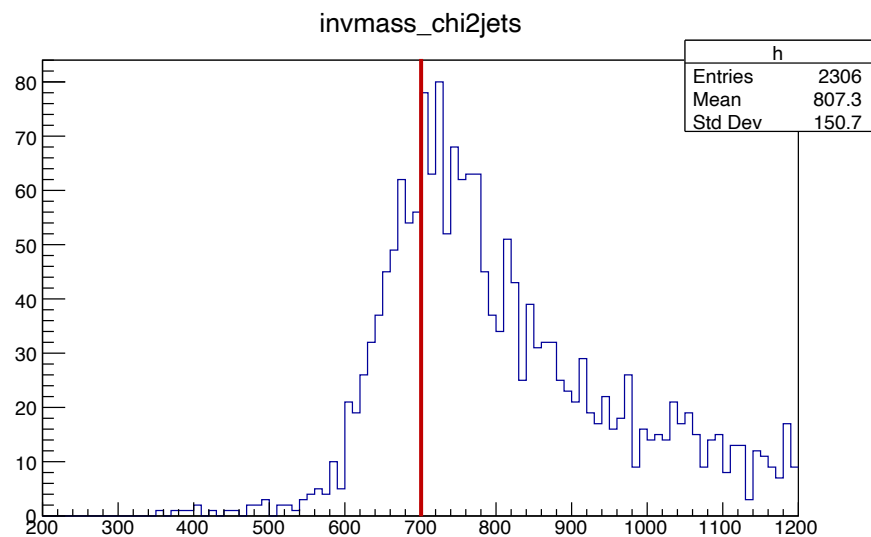
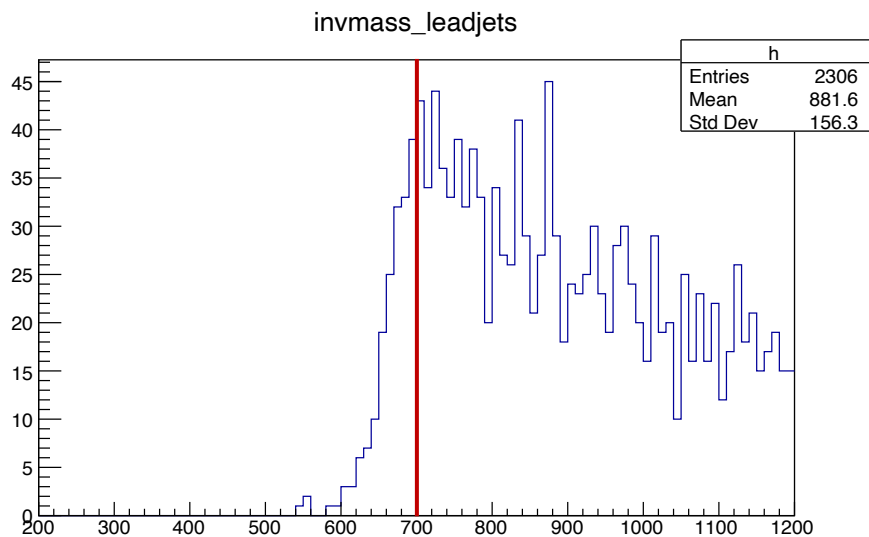
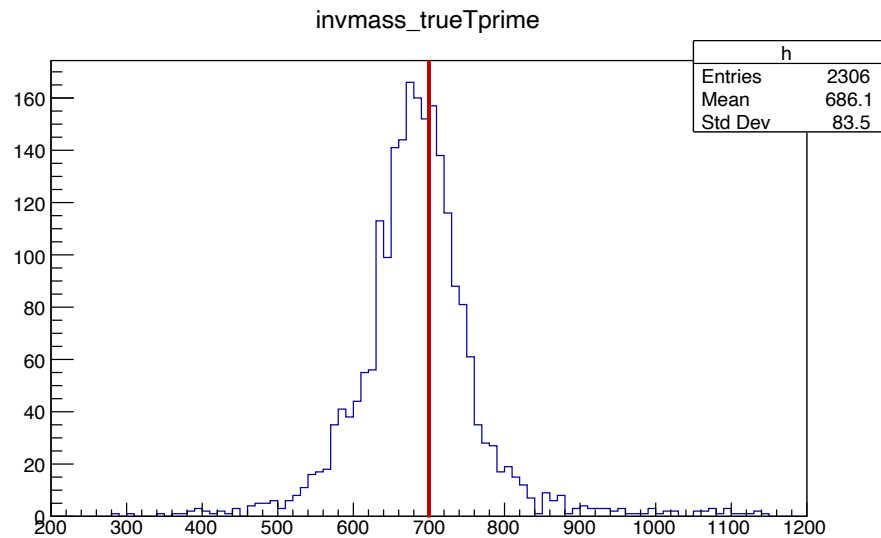
- Inserting in framework in progress
- Next: Check the portion of jets from true Tprime from Chi2 method

Tested with one file(27300 events) of
TprimeBToTH_M-700_LH_2018



Mass distribution from 3 methods

T' mass is modeled – 700 GeV



Synchronization

Target sample

- TprimeBToTH_M-700_LH_TuneCP5_PSWeights_13TeV-madgraph_pythia8 (RunII Summer19UL18)
- RunII Summer19UL18MiniAOD-106X_upgrade2018_realistic_v11_L1v1-v2/MINIAODSIM
- Compare with: RunII Summer19UL18MiniAODv2-106X_upgrade2018_realistic_v16_L1v1-v1/MINIAODSIM

Analysis flow – Cut0

- 1) HLT && nJets >= 6 && nb(DeepCSV)Jets >= 3
- 2) jet1pt > 170 && jet2pt > 130 && jet3pt > 80 && HT (all jets pT > 30) > 500
- 3) minimum Chi2 < 15
- 4) 2nd Top mass > 250
- 5) Higgs mass > 100

HT seems *similar*, but..

```
Run Number 1 Evt Num 17 LS 1 M 5j 1075.73 HT 1312.25 chi2 2.75902
Run Number 1 Evt Num 79 LS 1 M 5j 1379.15 HT 904.219 chi2 4.64321
Run Number 1 Evt Num 459 LS 5 M 5j 762.969 HT 792.75 chi2 1.13689
Run Number 1 Evt Num 856 LS 9 M 5j 1259.3 HT 1094.7 chi2 2.42298
Run Number 1 Evt Num 906 LS 10 M 5j 703.115 HT 885.188 chi2 0.989069
```

```
Run Number 1 Evt Num 17 LS 1 M 5j 688.383 HT 1300.01 chi2 2.17648
Run Number 1 Evt Num 79 LS 1 M 5j 686.67 HT 903.366 chi2 5.54663
Run Number 1 Evt Num 194 LS 2 M 5j 552.728 HT 1075.63 chi2 2.02365
Run Number 1 Evt Num 240 LS 3 M 5j 843.639 HT 922.396 chi2 0.716359
Run Number 1 Evt Num 459 LS 5 M 5j 767.607 HT 797.697 chi2 1.38886
Run Number 1 Evt Num 524 LS 6 M 5j 739.476 HT 1059.57 chi2 0.395842
Run Number 1 Evt Num 704 LS 8 M 5j 684.775 HT 861.317 chi2 3.25032
Run Number 1 Evt Num 856 LS 9 M 5j 466.729 HT 1109.77 chi2 2.459
Run Number 1 Evt Num 906 LS 10 M 5j 700.134 HT 913.494 chi2 0.818252
```