

20 , Jun , 2013 , Naoyuki Kamo

Z+jet

- Z+b-jetで使用可能なデータ量を調べる
 - 使用データ
 - data12_8TeV.
00212142.physics_Muons.merge.NTUP_JETMET.r4065_p1278_p
1344_p1345_tid01118277_00/
 - イベント数：589562
 - jetアルゴリズム：jet_AntiKt4TopoEM
 - bin separation：{10, 15, 20, 25, 30, 35, 45, 60, 80, 160, 210, 260}GeV
 - $66\text{GeV} < \text{Mass}(Z_{\mu\mu}) < 116\text{GeV}$

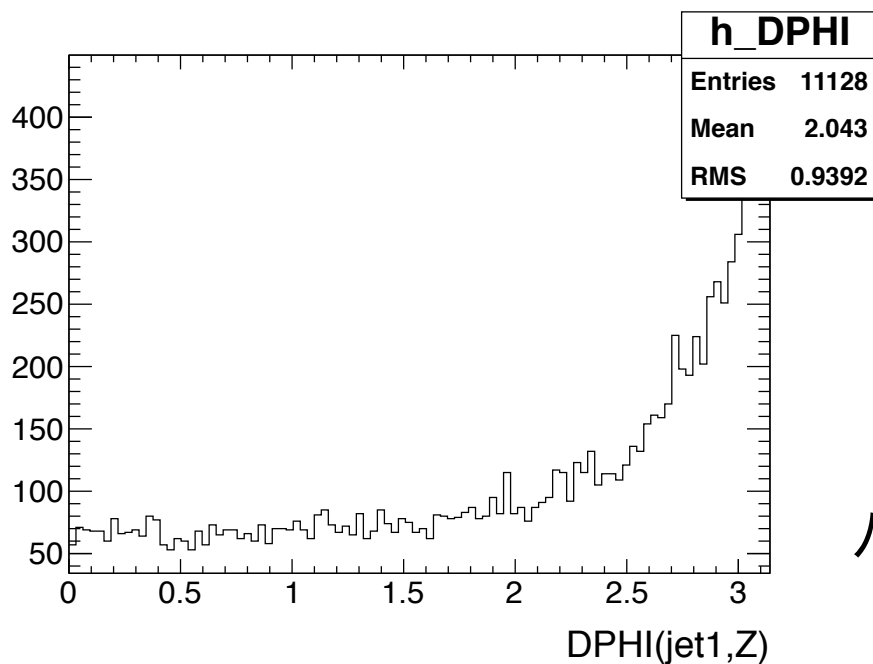
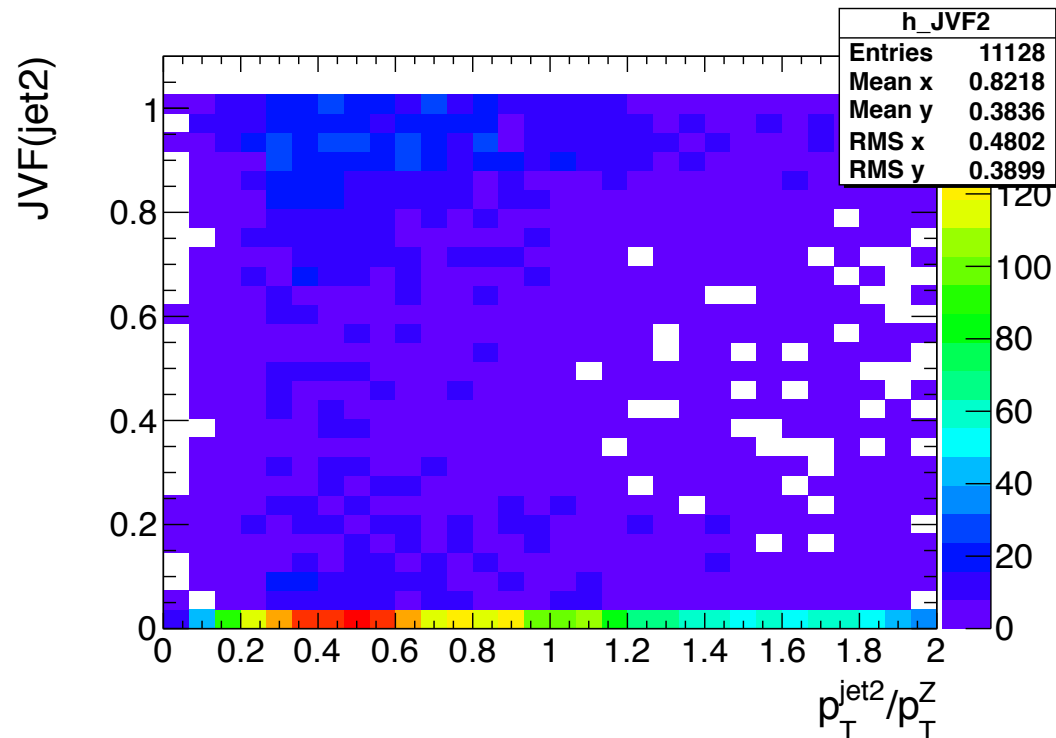
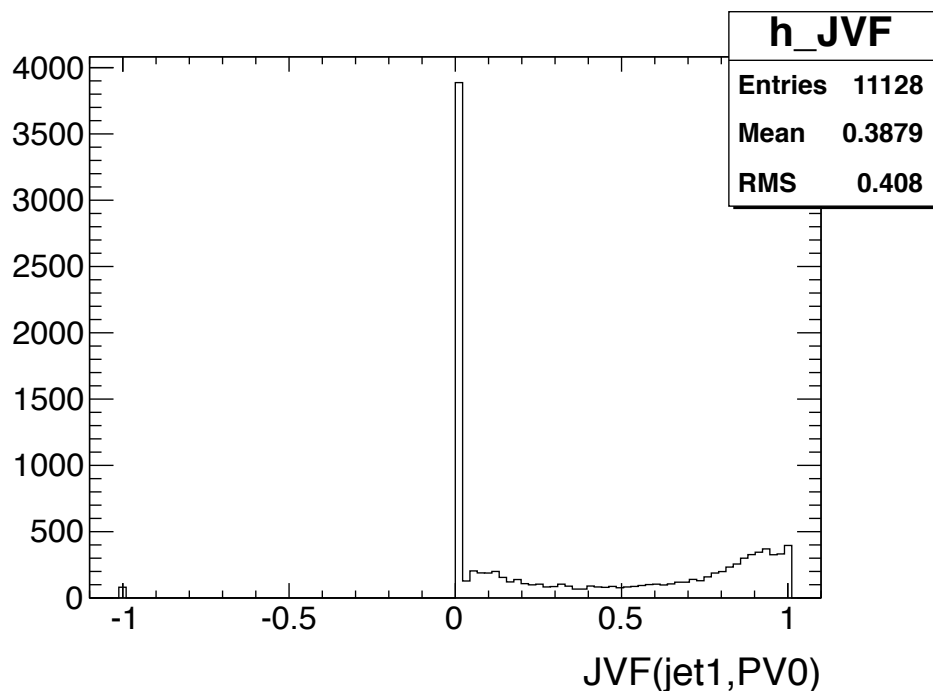
cut条件

- $p_T(\text{jet1}) > 10\text{GeV}$, $\eta(\text{jet1}) < 1.2$
- $p_T(\text{mu1}) > 20\text{GeV}$, $p_T(\text{mu2}) > 12\text{GeV}$
- $\eta(\text{mu1}), \eta(\text{mu2}) < 2.5$
- $dr(\text{jet1}, \text{mu1}), dr(\text{jet1}, \text{mu2}) > 0.35$

- $JVF(\text{jet1}, PV(\text{mu})) > 0.5$
- $DPHI(\text{jet1}, Z) > \pi - 0.2$
- jet2Veto : $p_T(\text{jet2}) / p_T(Z) < 0.2$ OR $JVF(\text{jet2}) < 0.2$

四角で囲んだパラメータの分布を次のページに載せた

カットパラメータの分布

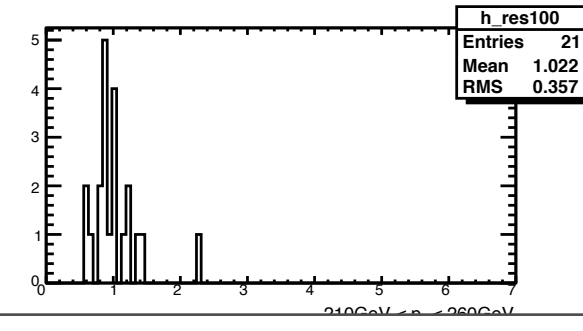
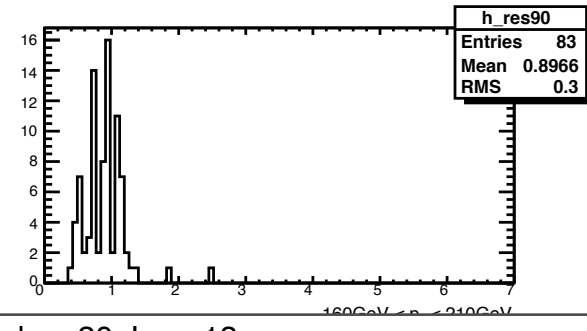
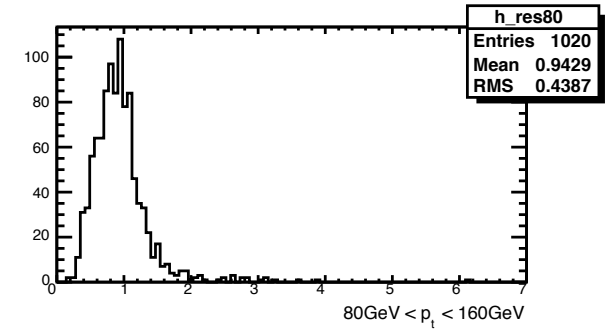
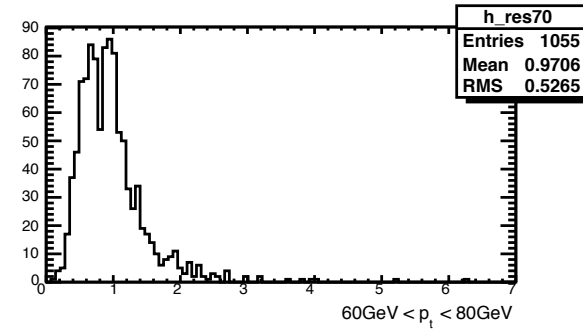
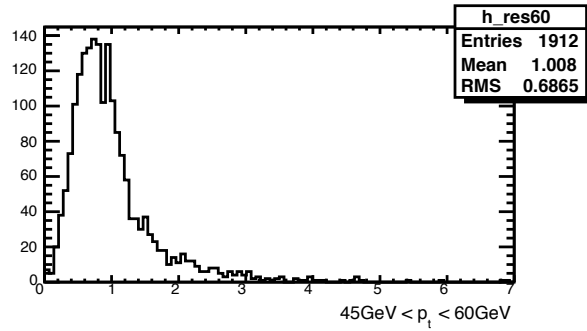
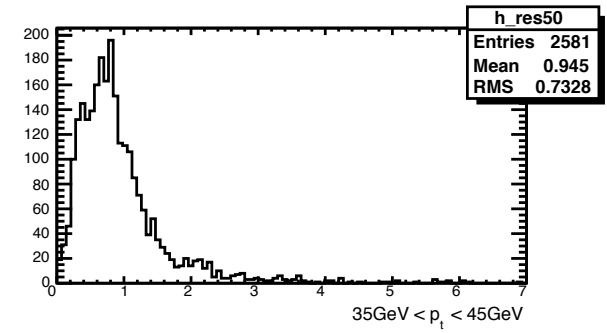
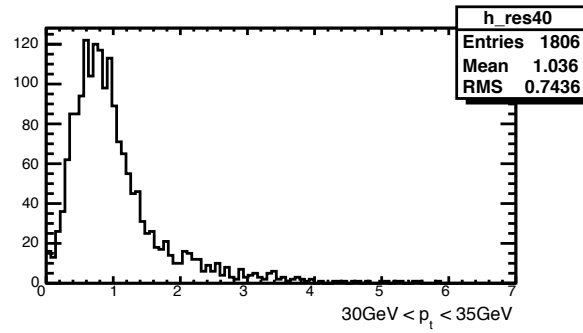
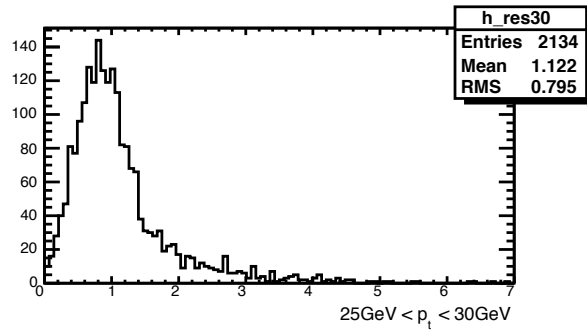
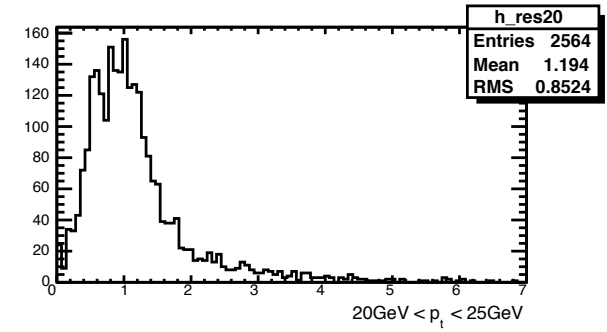
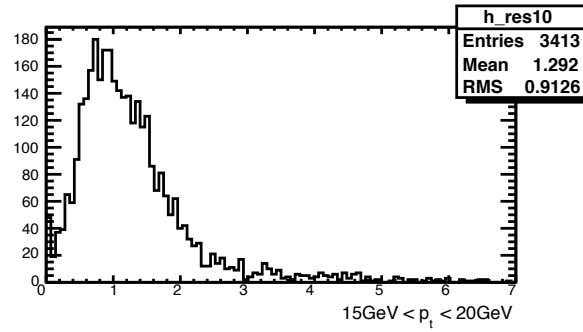
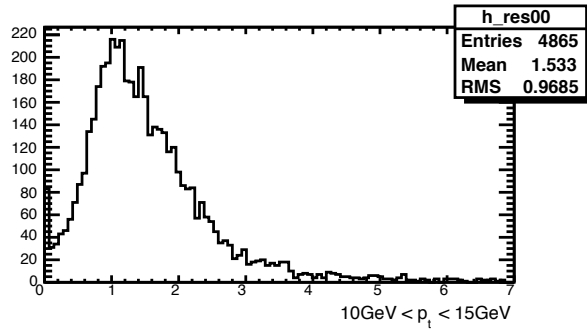


(前ページの四角で囲んでいない
パラメータのカットをかけた状態)

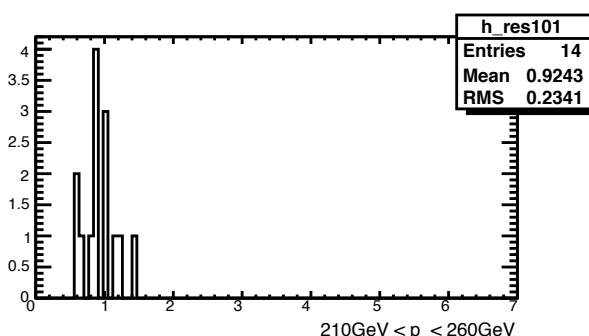
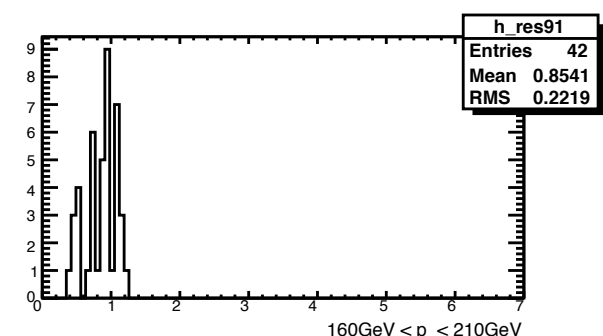
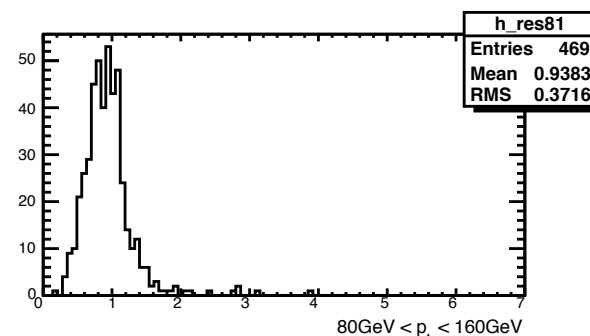
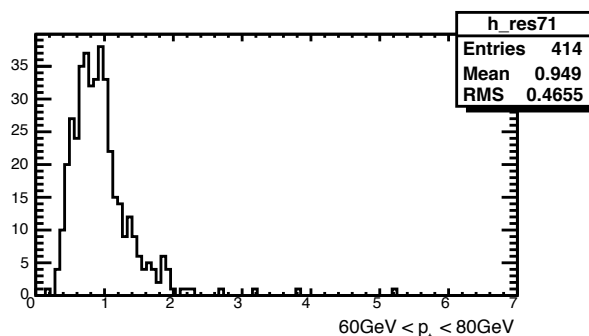
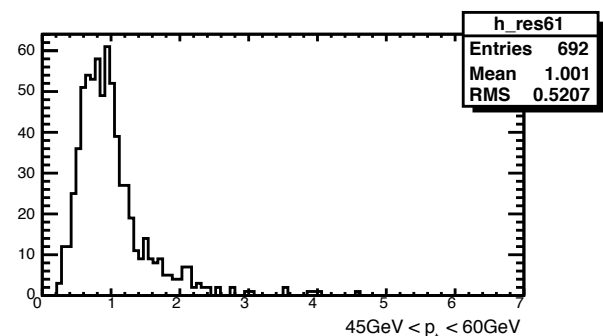
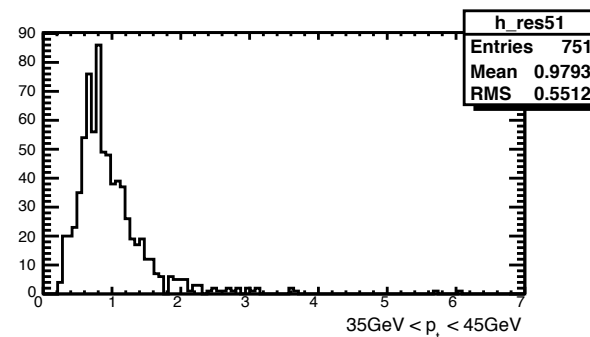
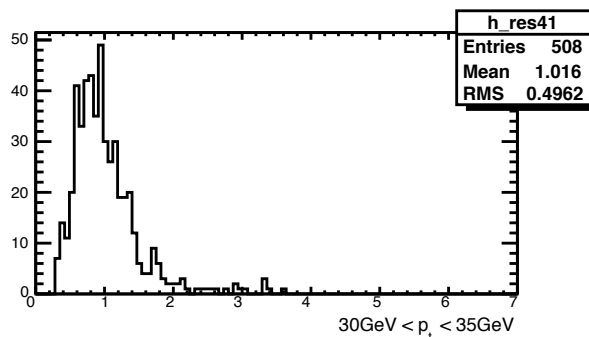
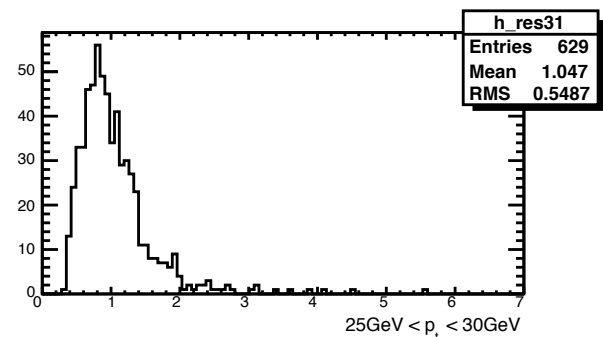
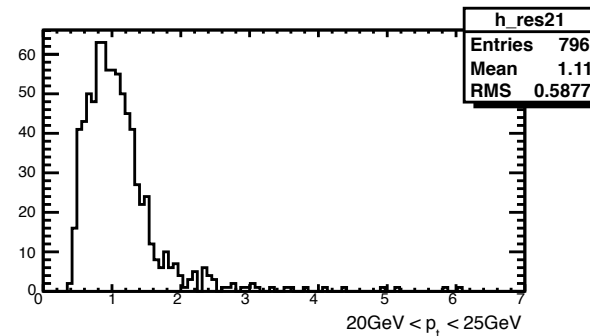
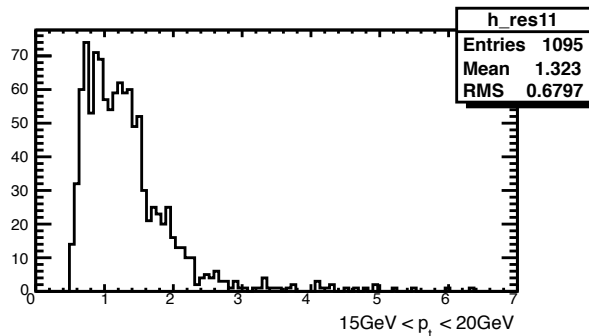
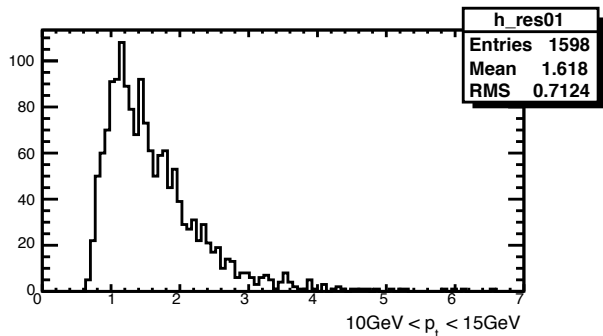
pT response distribution

- p6-10に $pT(\text{jet1}) / pT(Z)$ の分布のカット後の推移をのせた。

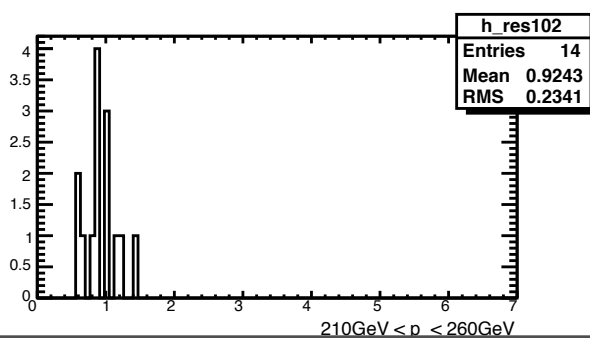
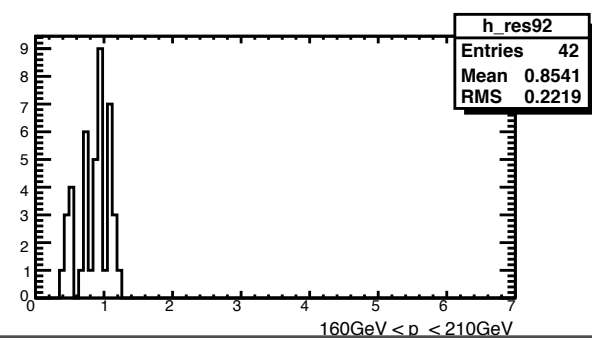
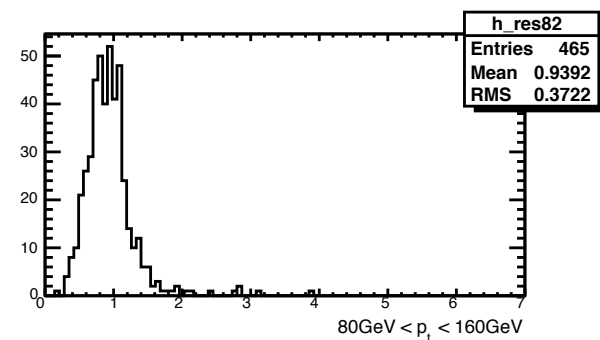
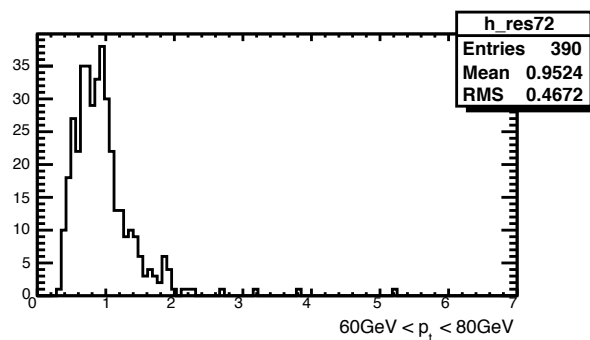
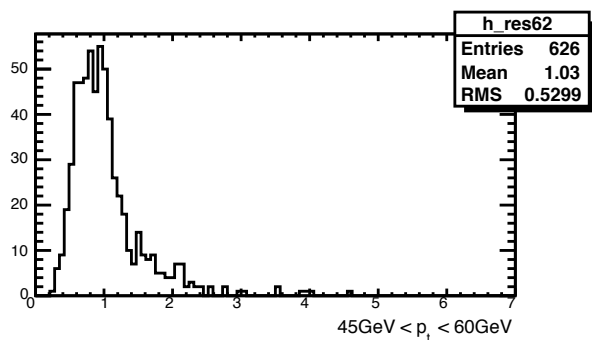
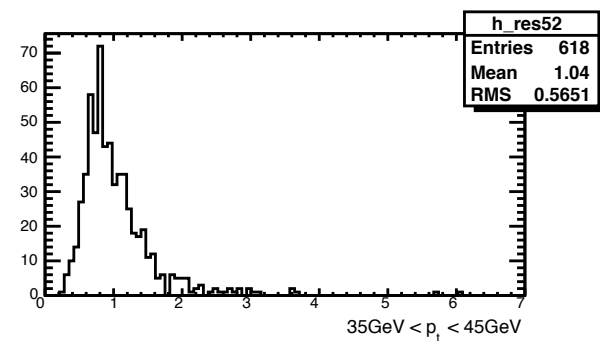
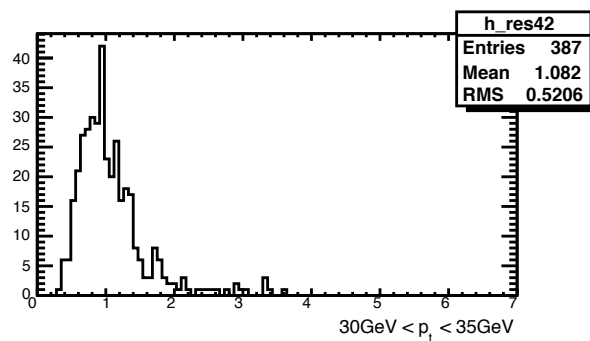
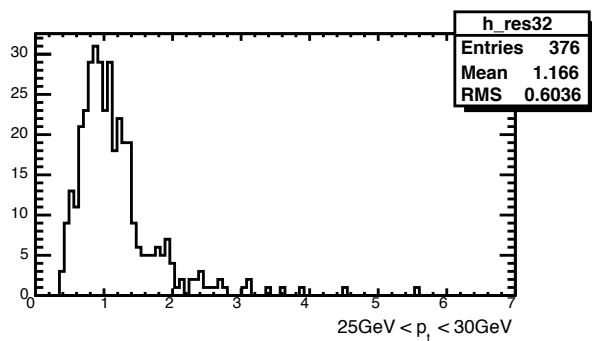
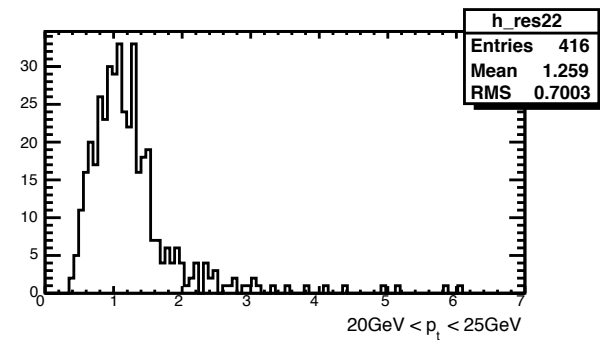
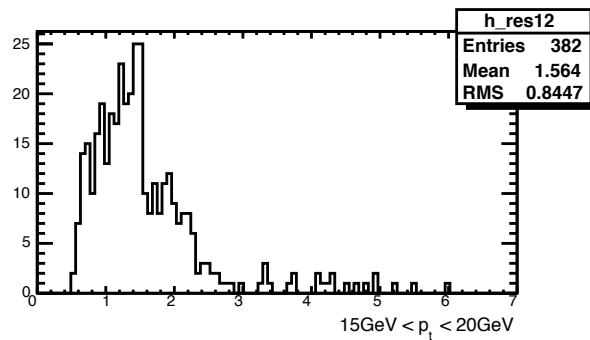
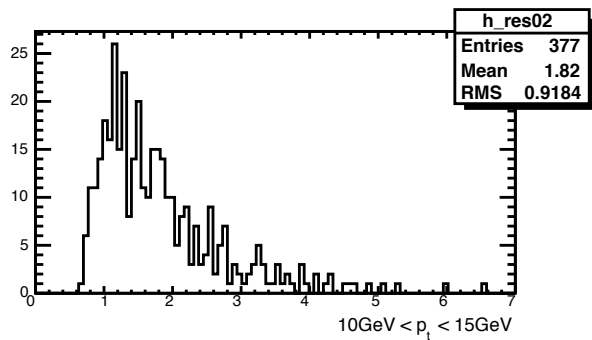
cutなし



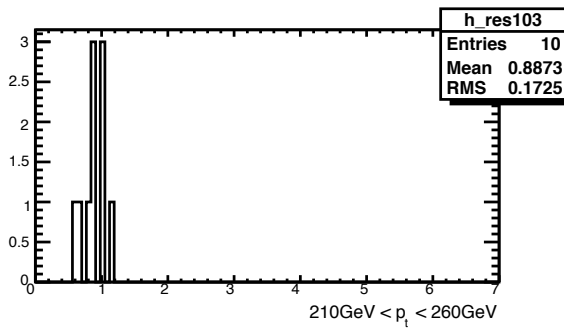
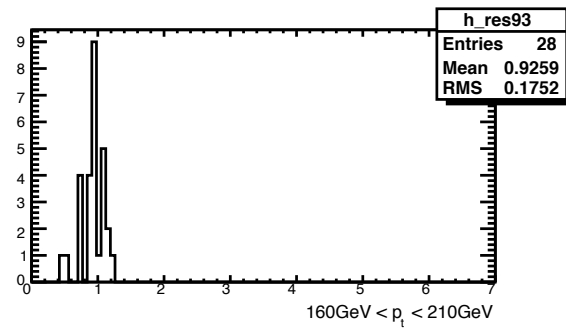
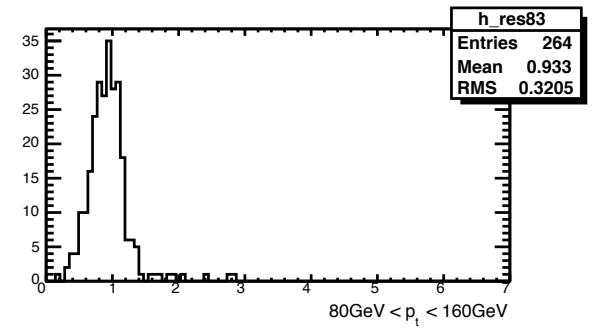
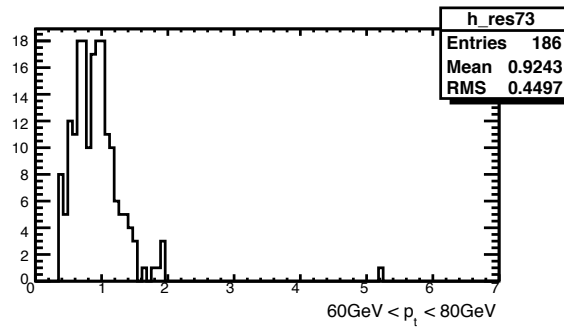
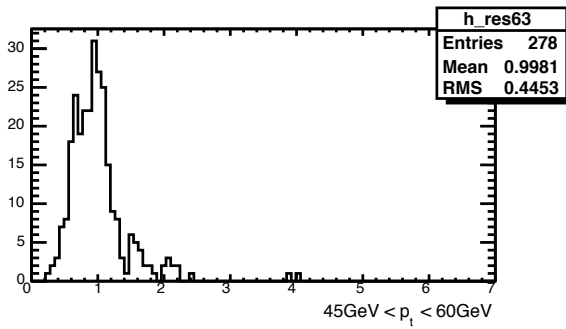
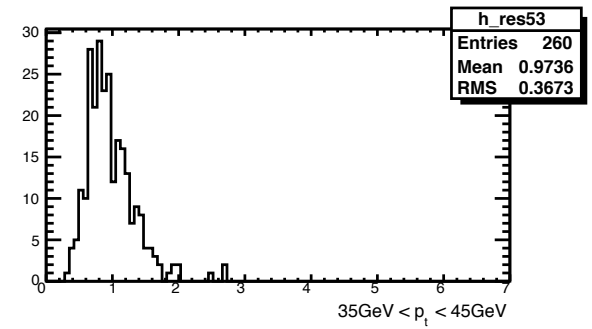
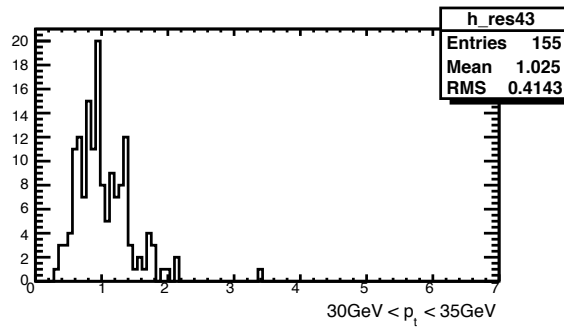
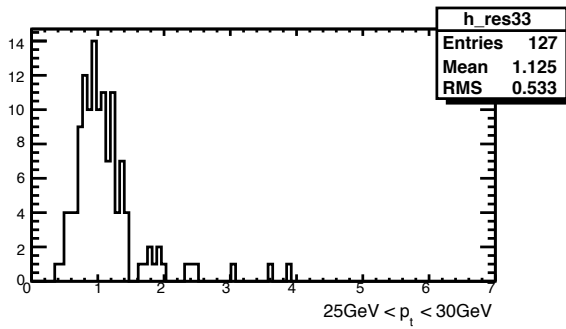
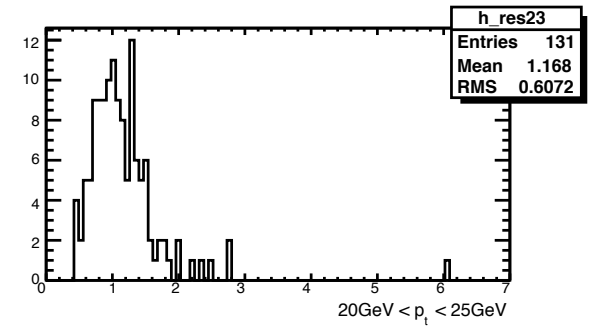
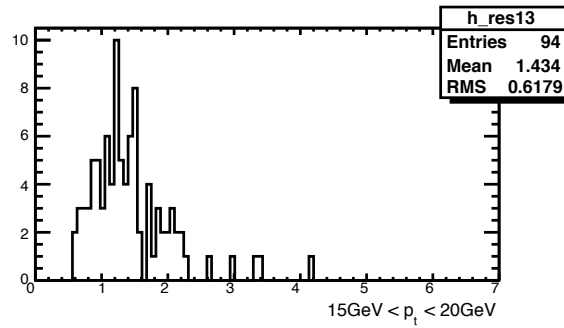
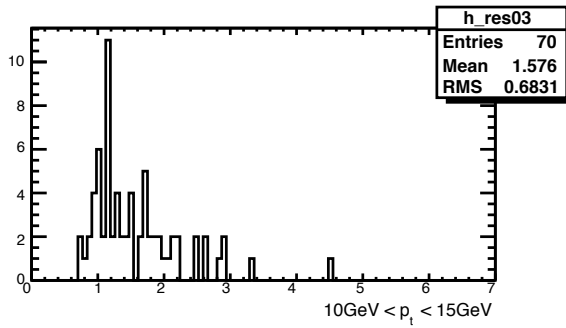
$p_T(\text{jet}), p_T(\text{mu}), \eta(\text{jet}), \eta(\text{mu}), dr$ のカット後



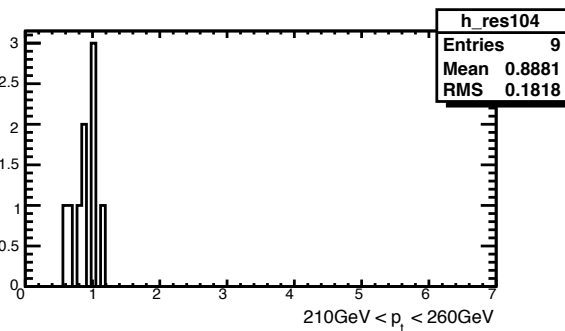
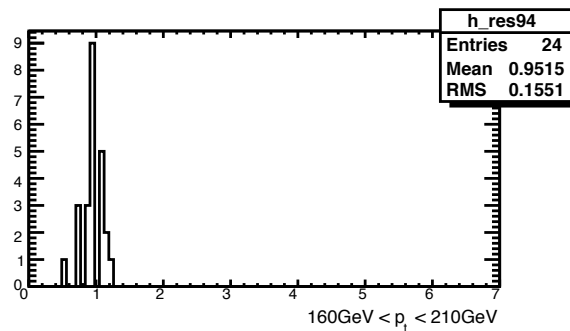
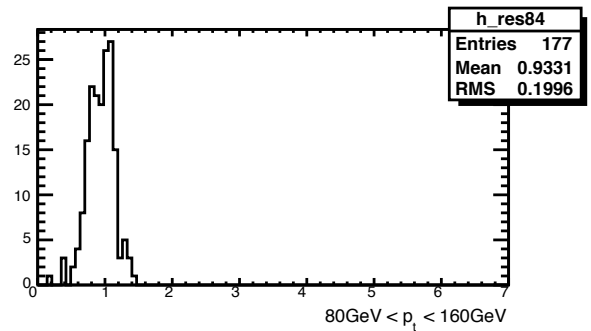
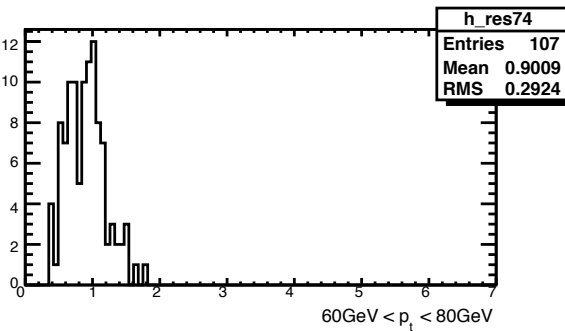
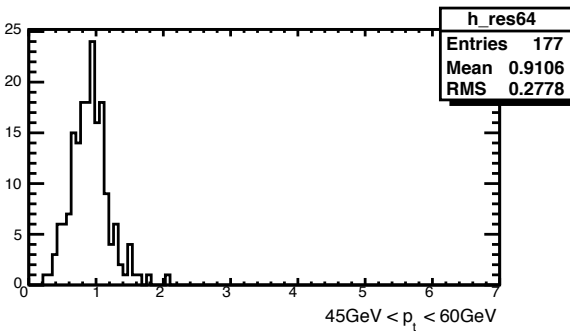
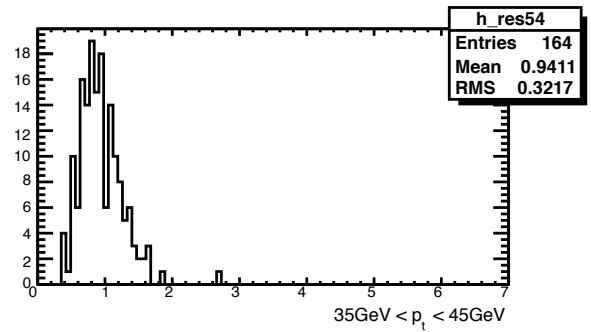
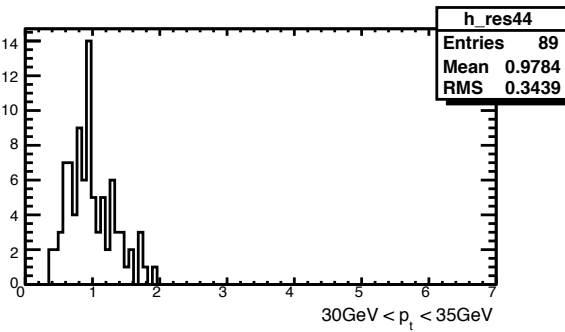
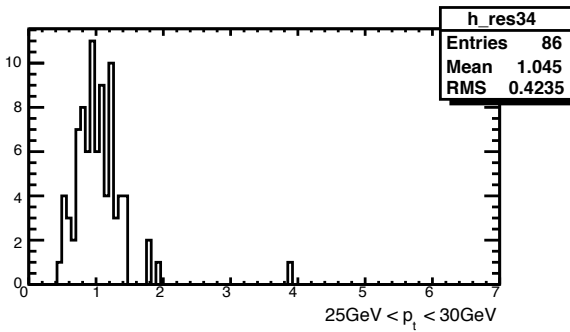
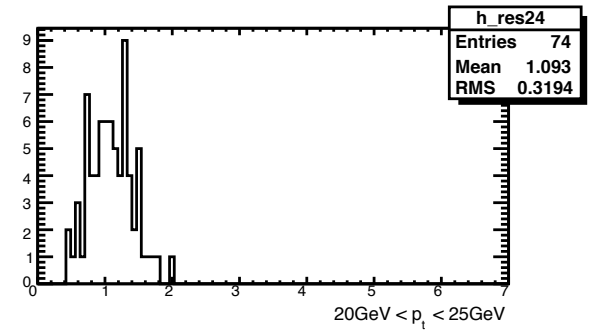
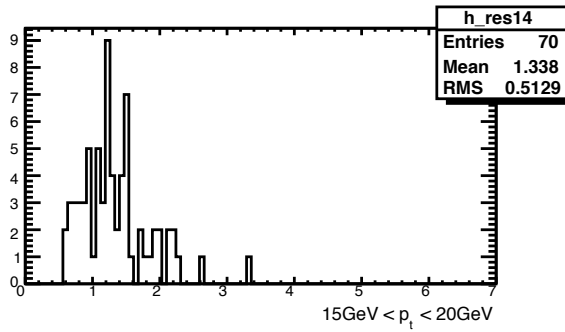
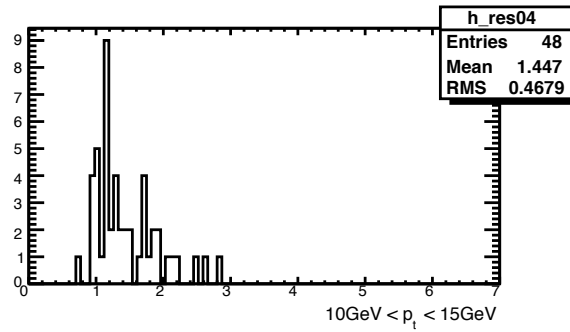
JVF > 0.5 (以降、前のページのカットを含む)



JVF > 0.5 and DPHI > $\pi - 0.2$



JVF > 0.5 and DPHI > $\pi - 0.2$ and jet2Veto



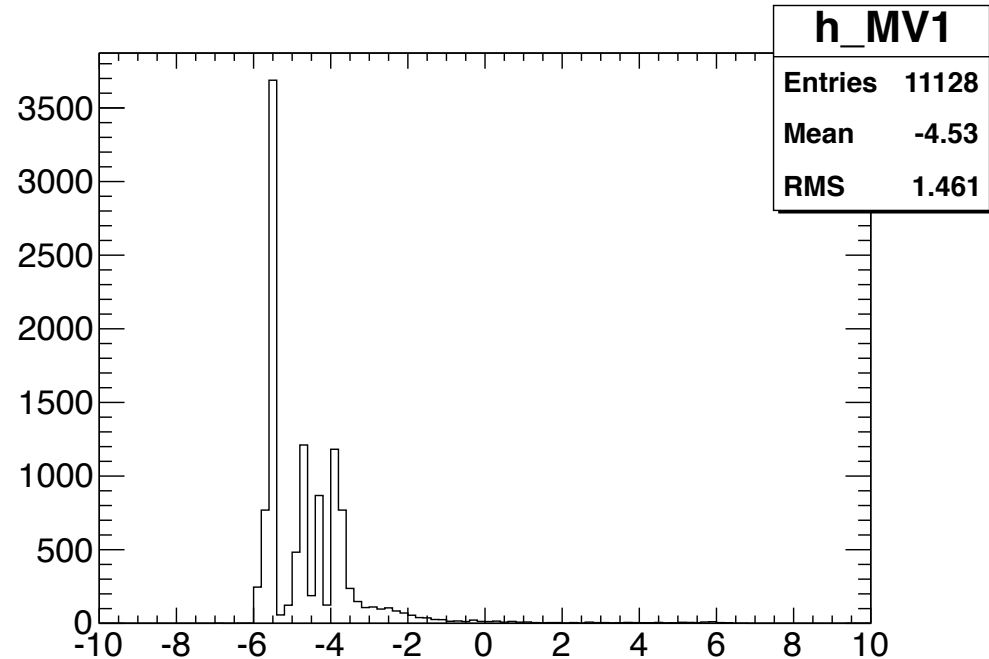
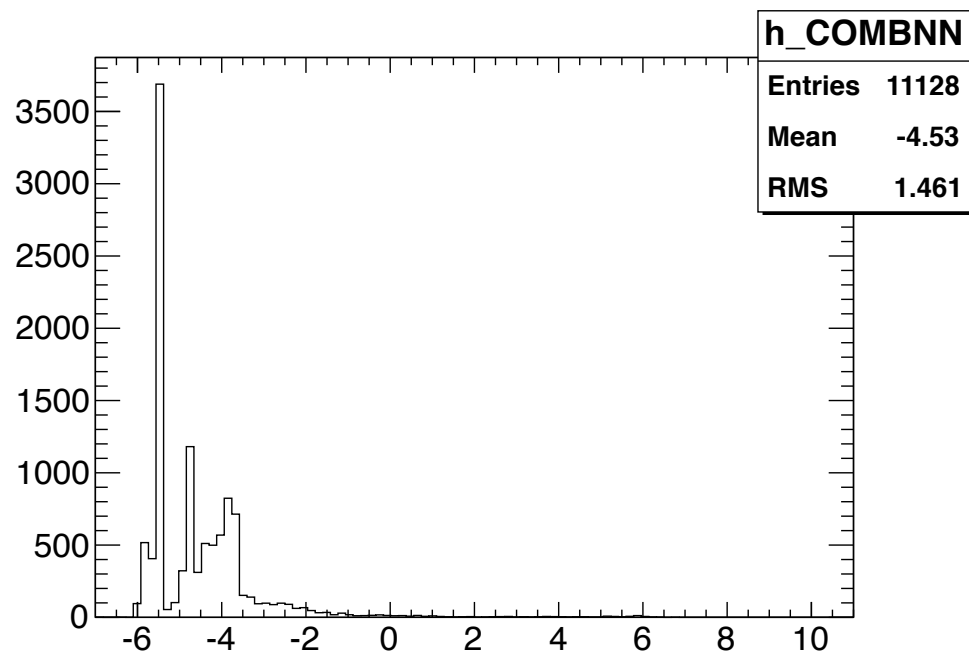
統計量について

- 例えば $30\text{GeV} < \text{Mass}(Z) < 35\text{GeV}$ で89イベント残っている。
- 統計量のおよそ0.015%
- stream physics_MuonsのDataはpy-Amiで数えた所、572667450イベント(?)
- $572667450 * 0.015\% = 85900$

b-tag

- 今度はb-jetの量を見積もるために、b-tagのパラメータの分布を調べる
 - ちなみにMCのときはtruth-b-jetはおよそ全体の3%だった
- 今回は、MVIとJetFitterCOMBNNの分布を調べた
- <https://twiki.cern.ch/twiki/bin/viewauth/AtlasProtected/AnalysisI7> によると
 - JetFitterCOMBNN
 - 57% ($w > 2.20$)
 - 60% ($w > 1.80$)
 - 70% ($w > 0.35$)
 - 80% ($w > -1.25$)
 - MVI
 - 60 % ($w > 0.905363$)
 - 70 % ($w > 0.601713$)
 - 75 % ($w > 0.404219$)
 - 85 % ($w > 0.0714225$)

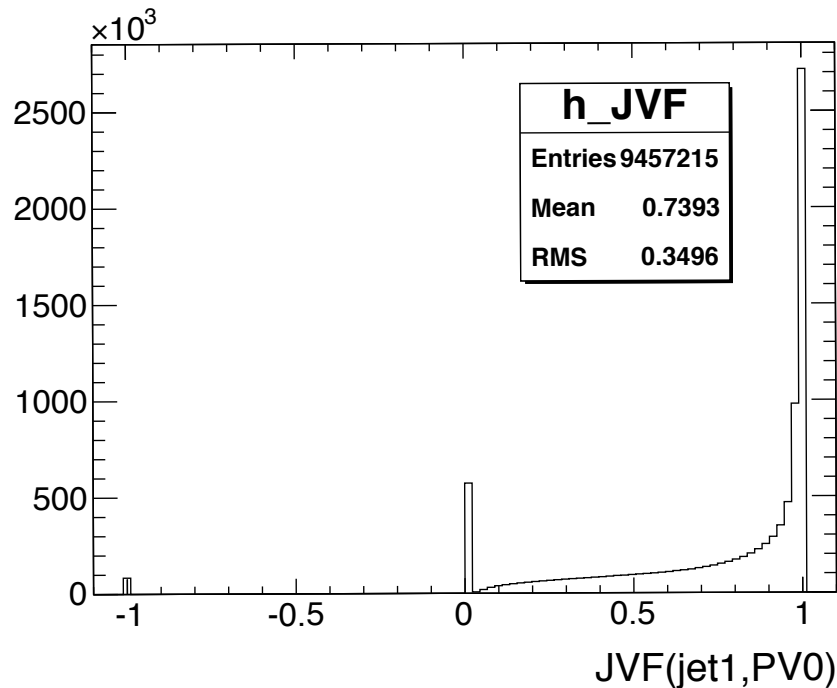
COMBBNN , MVI distribution



- twikiに書いてあるoperating pointだとほとんどb-jetがない？
- (コードの都合上の下のcutがかかっている)
 - $p_T(\text{jet1}) > 10\text{GeV}$, $\eta(\text{jet1}) < 1.2$
 - $p_T(\text{mu1}) > 20\text{GeV}$, $p_T(\text{mu2}) > 12\text{GeV}$
 - $\eta(\text{mu1}), \eta(\text{mu2}) < 2.5$
 - $dr(\text{jet1}, \text{mu1}), dr(\text{jet1}, \text{mu2}) > 0.35$

MC di-jet のJVF

- (ここから別の話にかわって)
- MC dijetサンプルを使ってJVFを分布を見た
- truth-jetにisolation ($dr < 1.0$ or 1.5) をした上で、対応するreco-jetに対するJVFをの分布を調べた



やることリスト

- Z+jet 解析
 - z+b-jetが統計的に可能かどうか調べる
- MC di-jetを使用したresponse
 - **new** JVF > 0.25 , 0.5 , 0.75でプロットを作る
 - **new** withMulntでresponseを調べる
 - semi leptonic decayによるmuonをtaggingするためにmuonの素性を調べる
 - response分布にFitするときの範囲を変えたときの中心値の不定性の評価
 - mc情報を使って、gluon jetとlight jetのtaggingをしてresponseを見る
 - GS Calibrationでflavor毎のresponseを見してみる
 - AntiKt4,6の間のpt比をとる