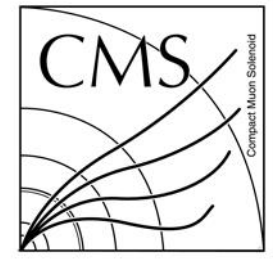# Training p_T with Data

Wei Shi, Andrew Brinkerhoff

# Basics

- Train 22,824 muons
  - SingleMu Ntuple
    - NTuple_SingleMuon_FlatNtuple_Run_2018D_v2_2018_10_25_SingleMuon_PU50_postSep26.root
  - EMTF track uniquely matched to RECO muon + Current P5 BDT pT as input
  - Replace LCT with Offline CSC segments for phi and theta
- Test 38,308 muons
  - SingleMu data (uniquely matched) + ZeroBias
    - NTuple_SingleMuon_FlatNtuple_Run_2018D_v2_2018_10_25_ZeroBias_PU50_postSep26.root
- Settings
  - Removed bias events for training and test
    - Removed events: nRecoMuonsTrig<2 && nRecoMuonsTrigCen==0
  - logPt target, 1/pT weight, Least Square loss function
  - 400 trees
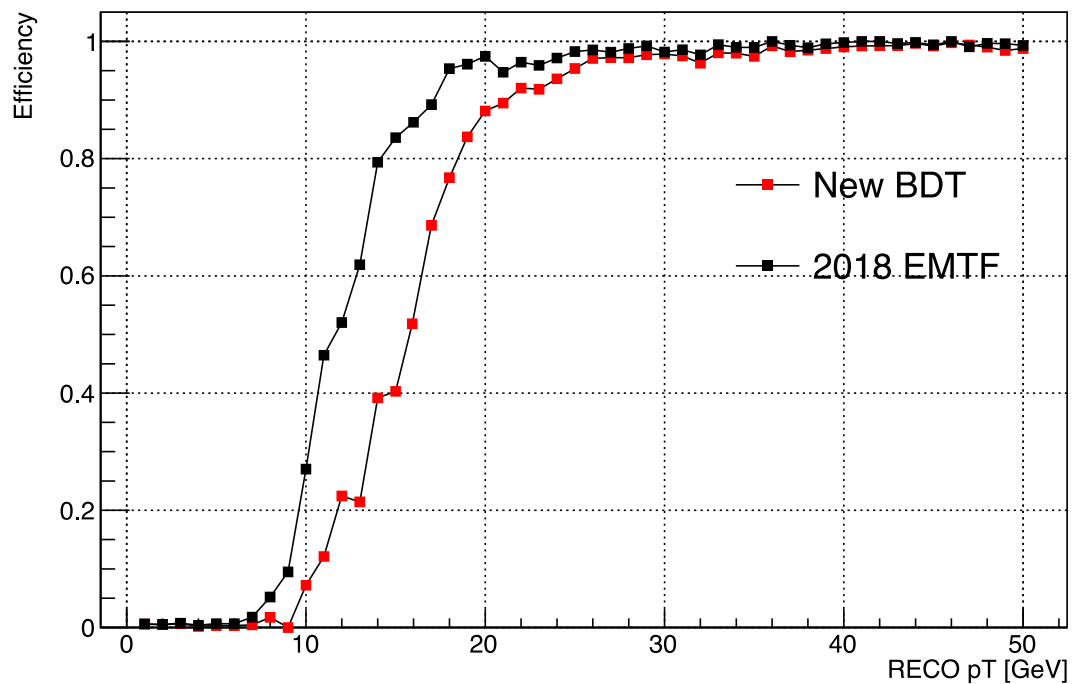
Efficiency @ 8GeV

Mode 15 trigger efficiency pT > 8 GeV
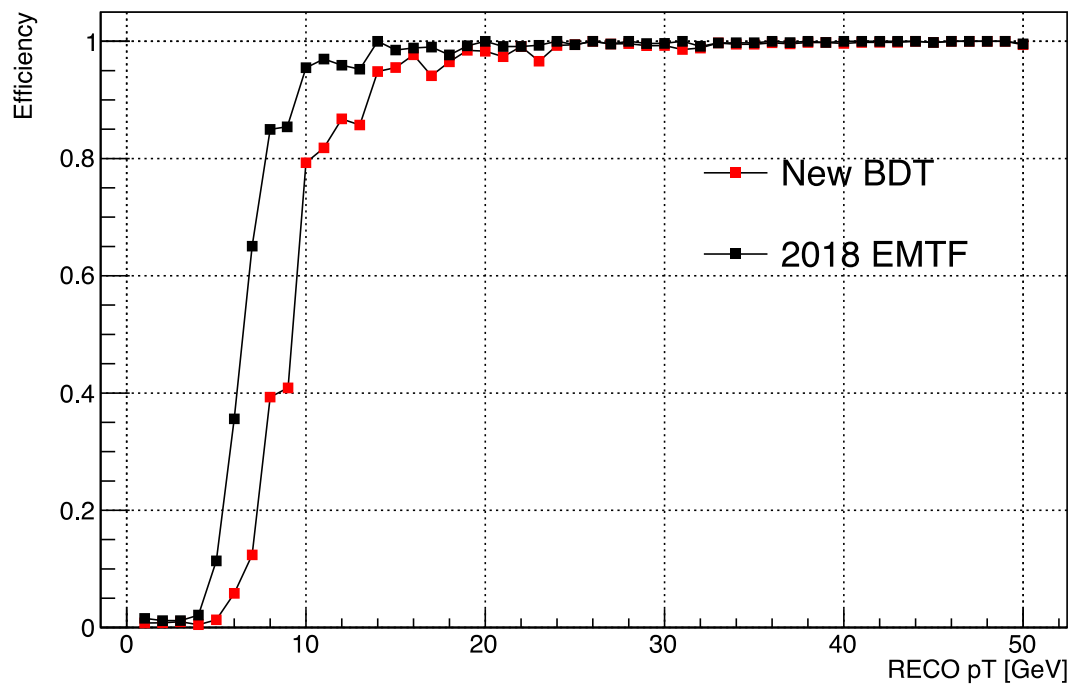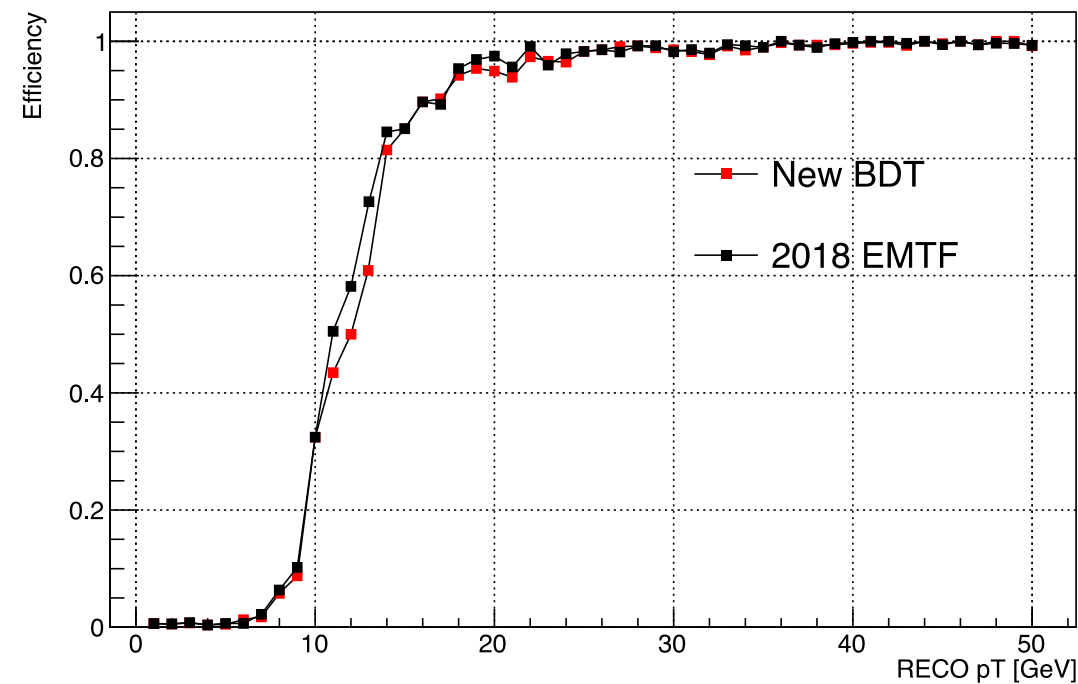
Mode 15 trigger efficiency(scaled) pT > 8 GeV
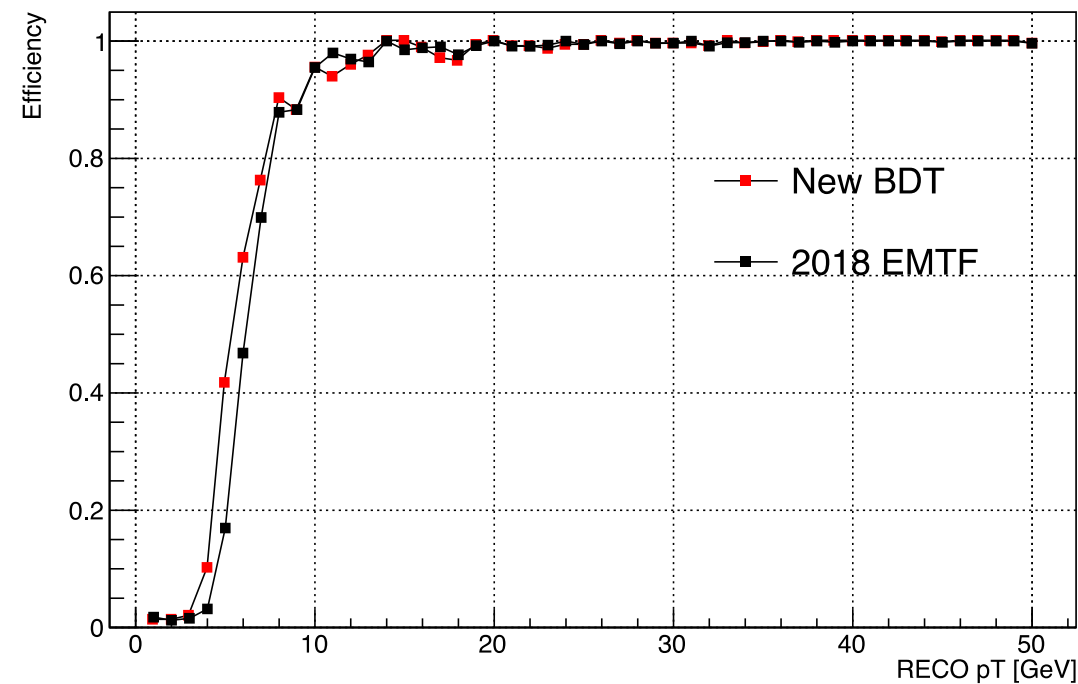
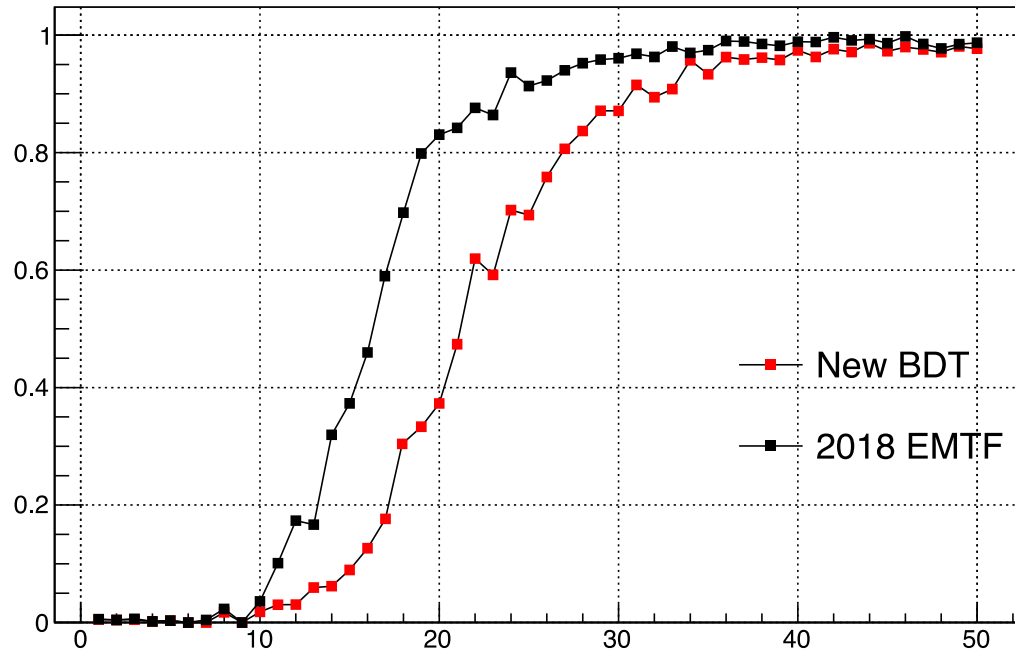# Efficiency @ 16GeV

Mode 15 trigger efficiency pT > 16 GeV
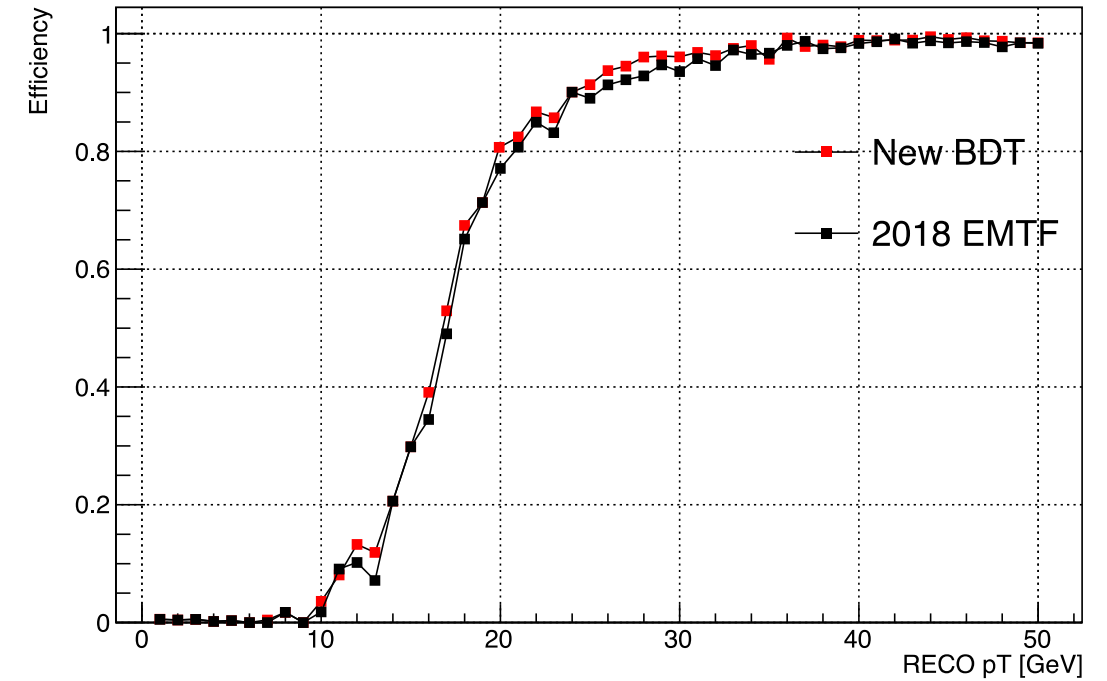
Mode 15 trigger efficiency(scaled) pT > 16 GeV

Efficiency @ 24GeV

Mode 15 trigger efficiency pT > 24 GeV

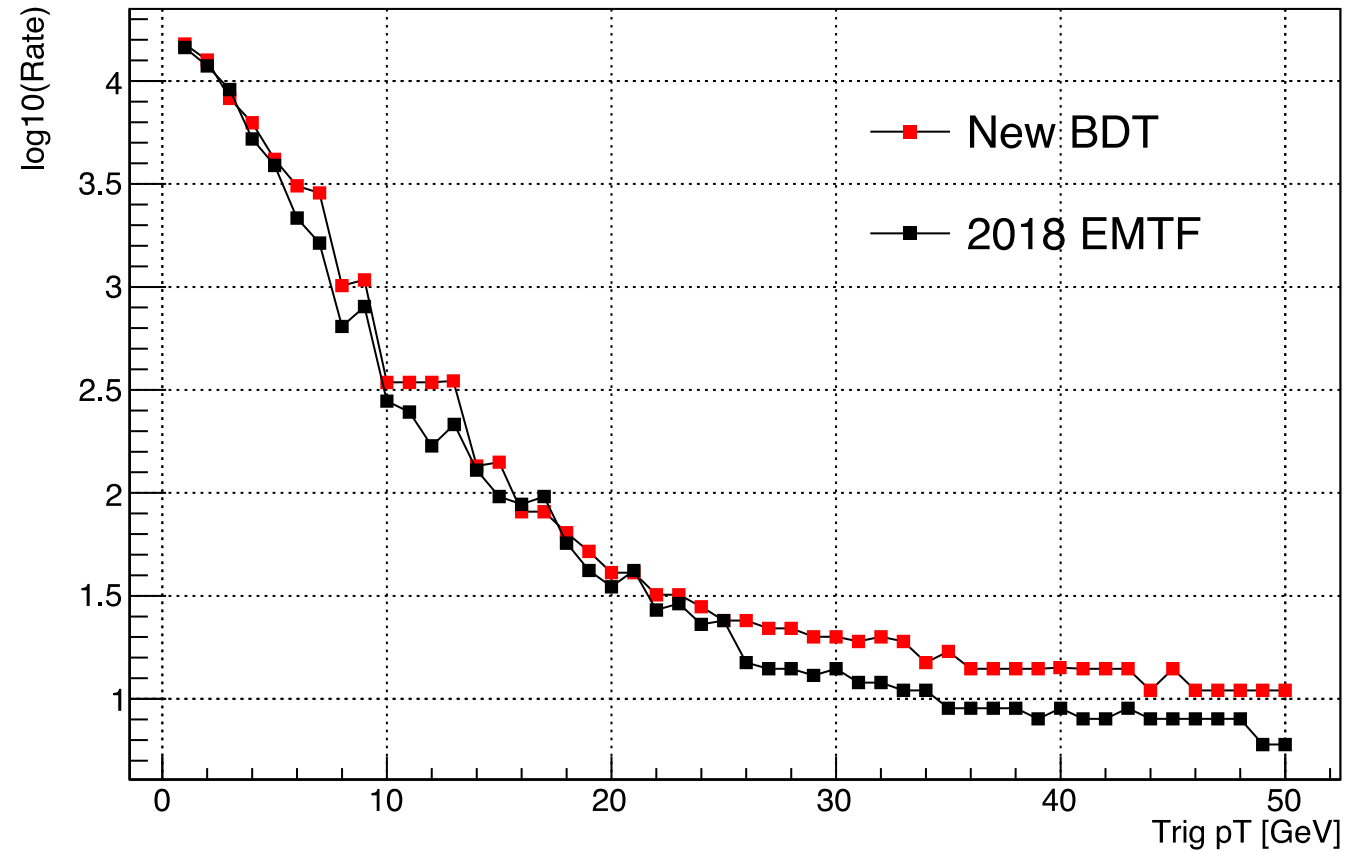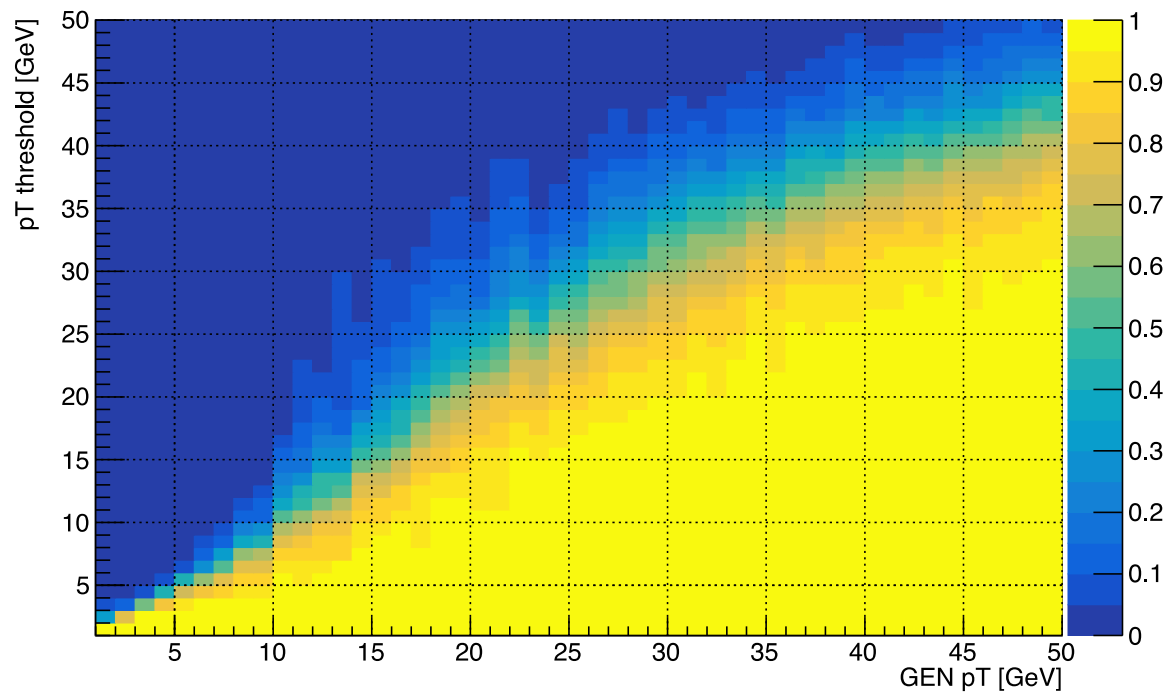Mode 15 trigger efficiency(scaled) pT > 24 GeV
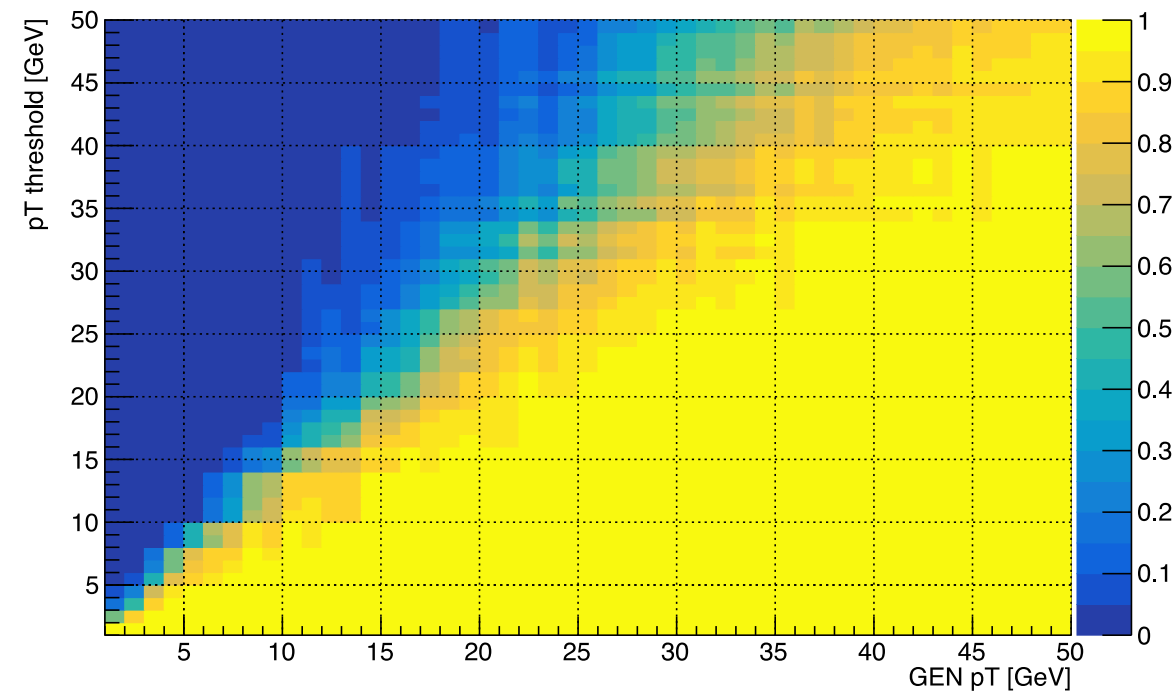
Rate

Mode 15 log(rate)vs 0.90 efficiency cut

Back Up

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New BDT 2D Efficiency

BDT trigger efficiency versus thresholds and GEN pT
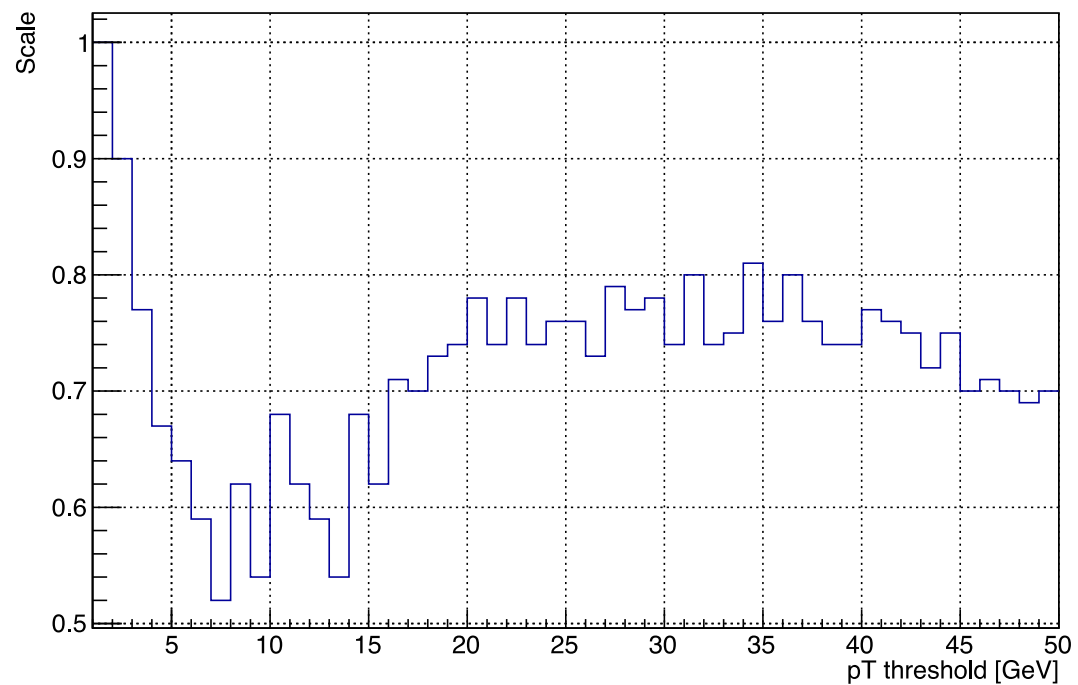
BDT trigger efficiency versus thresholds and GEN pT SCALED
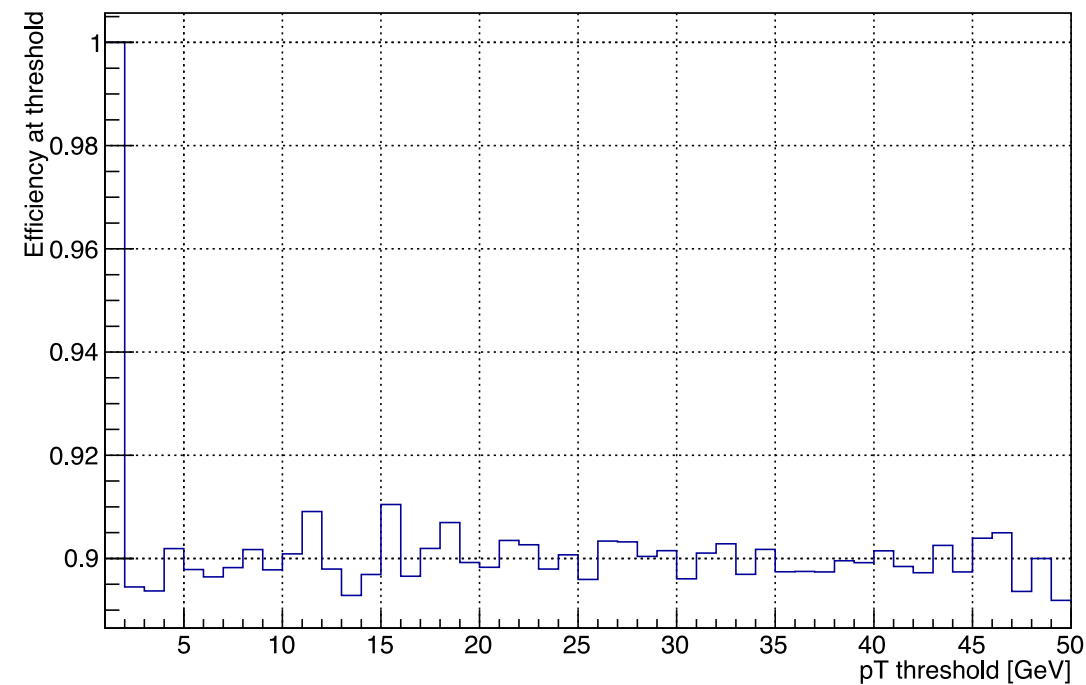
New BDT Scale

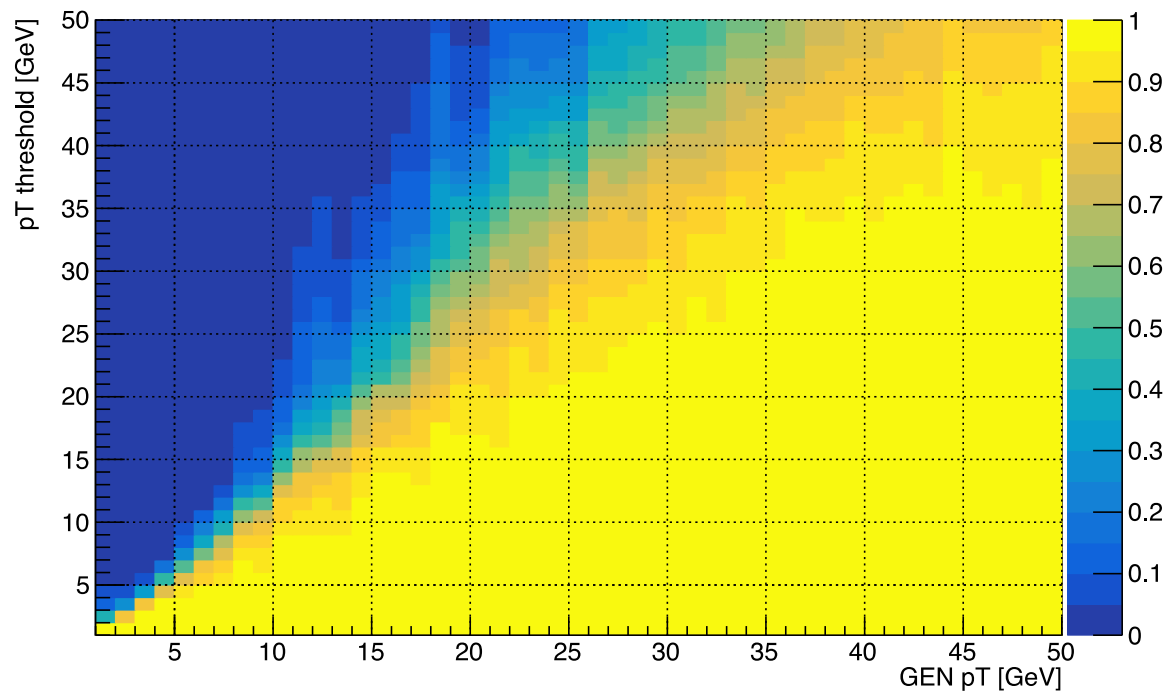BDT scale versus thresholds

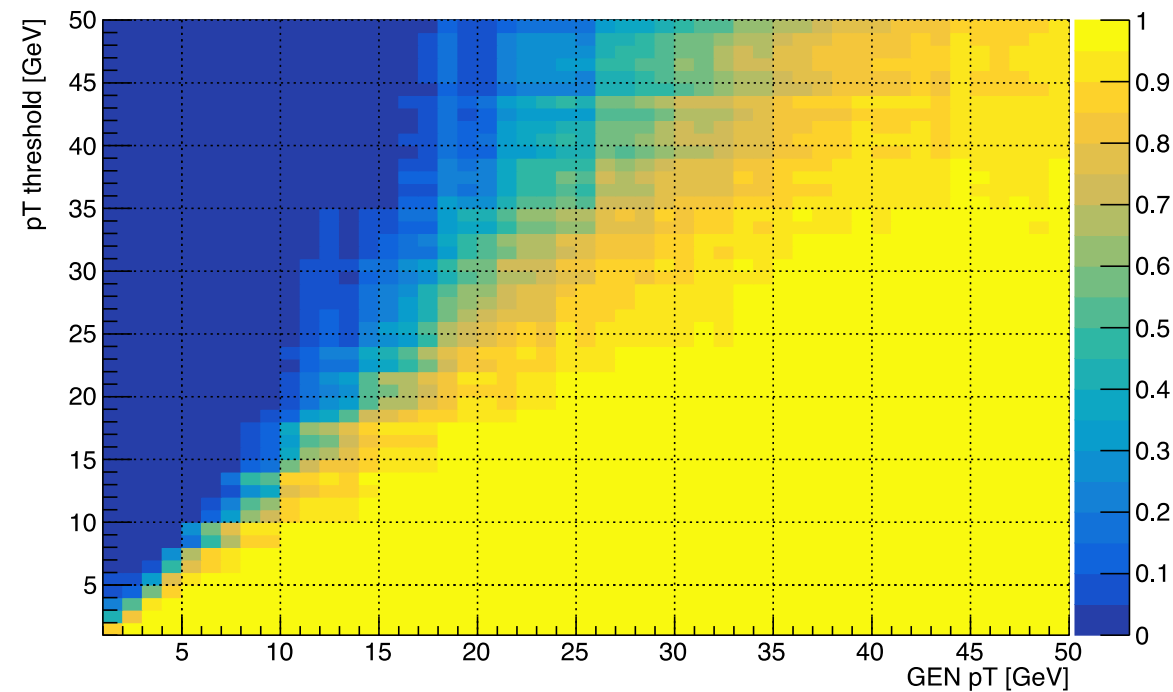BDT scale factor to 90% at thresholds

Legacy EMTF 2D Efficiency
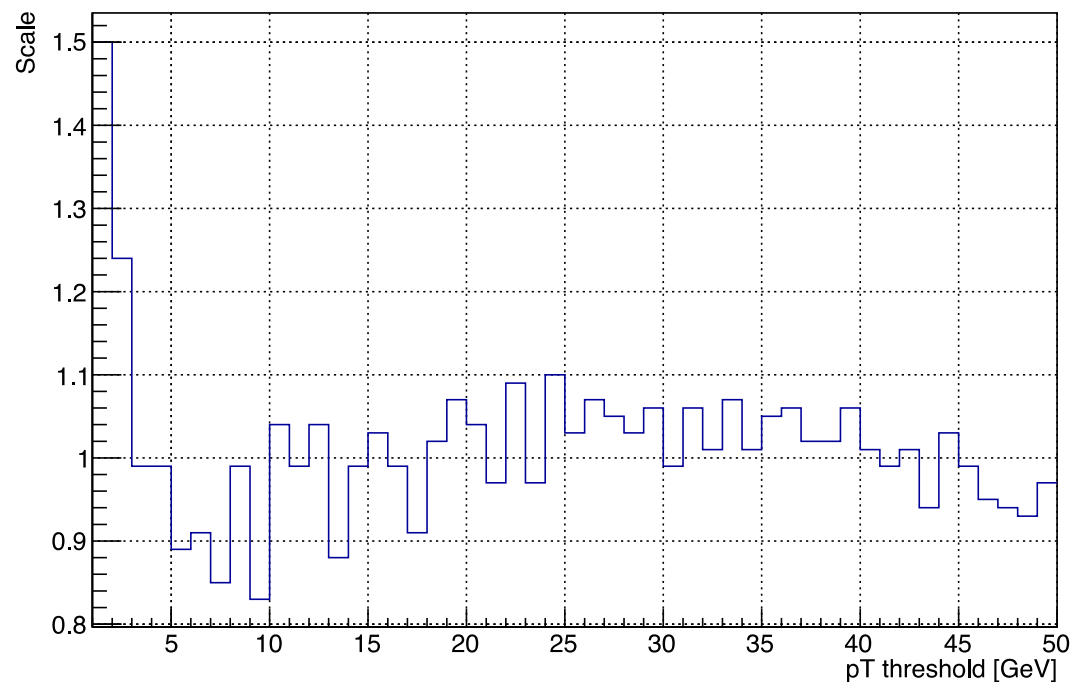
EMTF trigger efficiency versus thresholds and GEN pT

EMTF trigger efficiency versus thresholds and GEN pT SCALED

Legacy EMTF Scale

EMTF scale versus thresholds

EMTF scale factor to 90% at thresholds