2018 EMTF Emulator Study

EMTF Working Meeting

Wei Shi

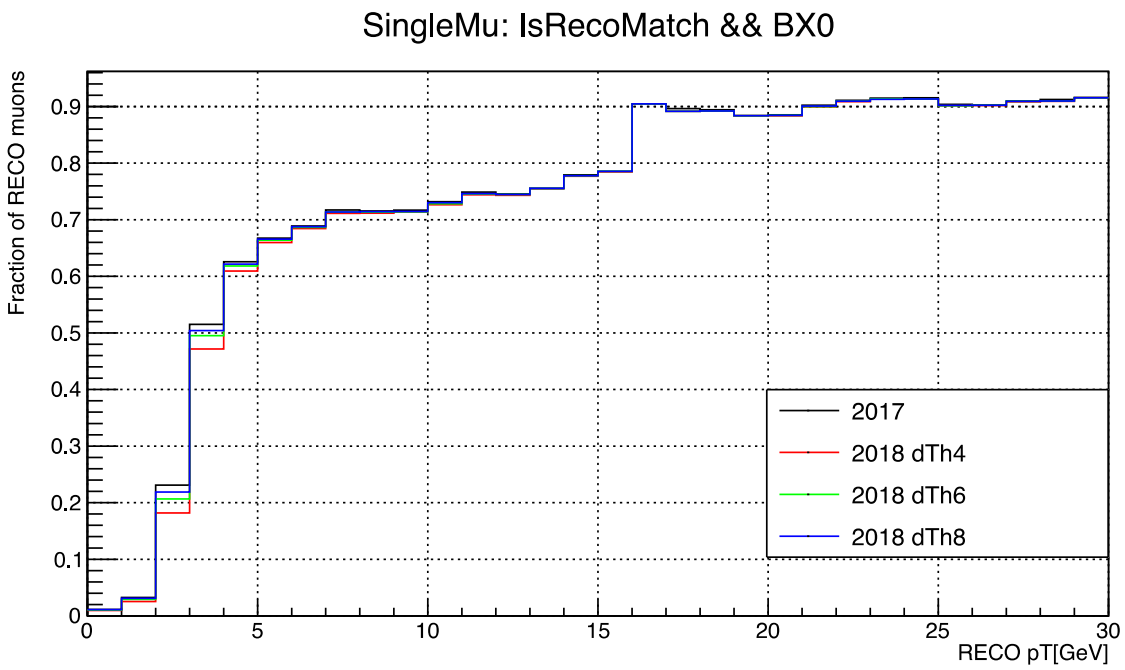
Basics

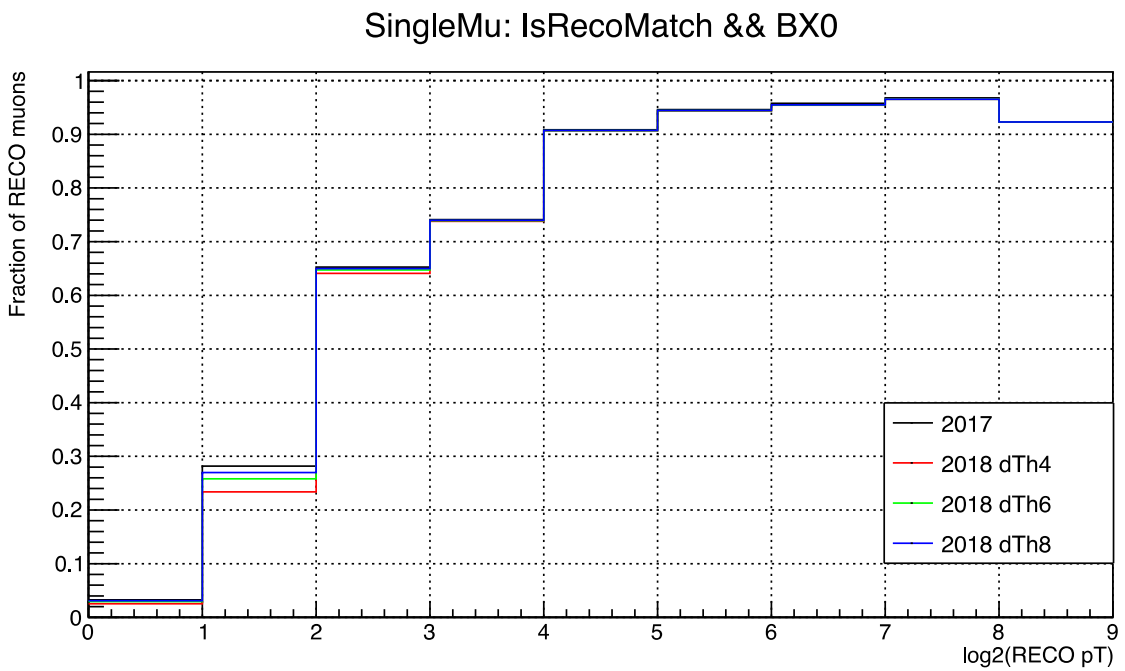
- 2018 Emulator Changes
  - BX window changed from 3→2
  - 2-station tracks with different hit BX removed
  - dTheta ambiguity when multiple LCTs are in the same chamber resolved
  - Mode 9 promoted to DoubleMu and mode 12 demote to MuOpen
  - Maximum dTheta for “Zone 0” (ring 1) changed from 8 to 4

Basics

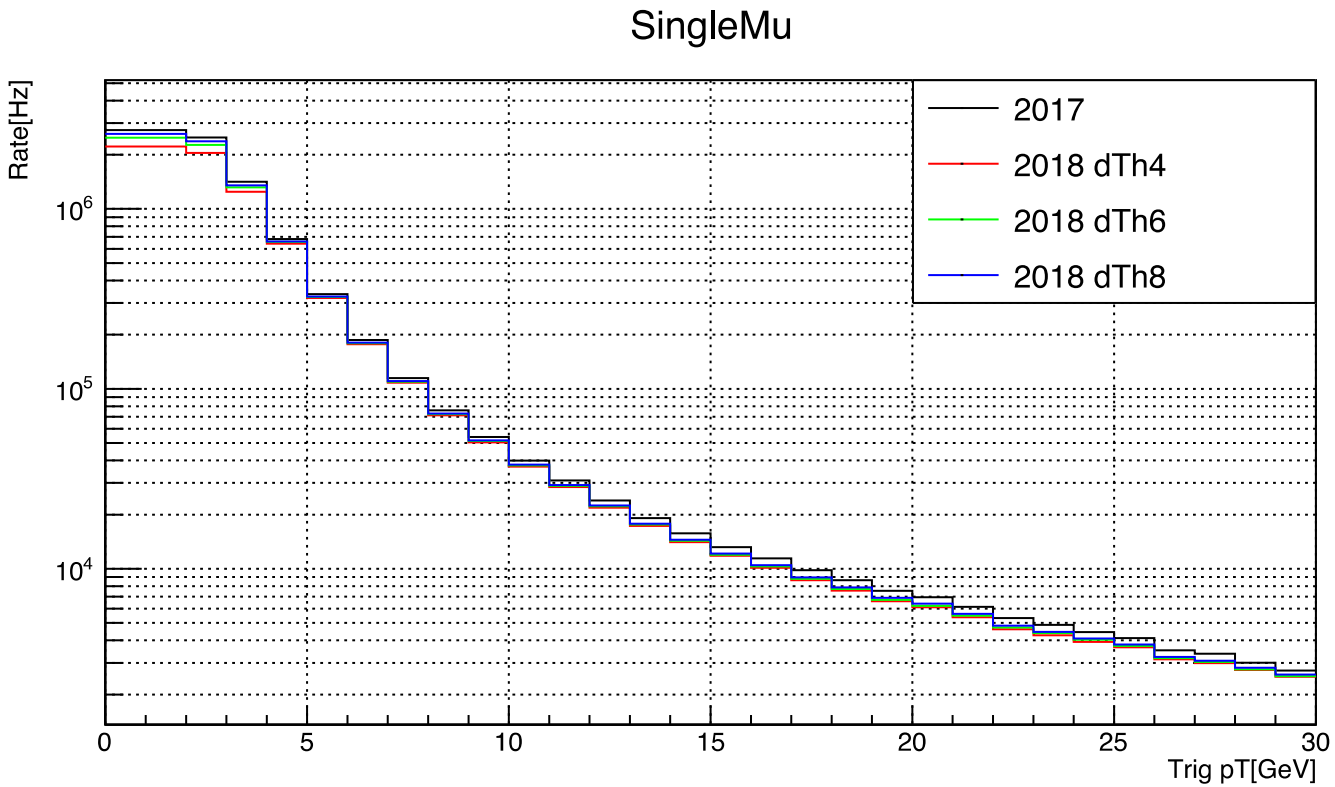
- Remove biased events
  - HLT_IsoMu27 or HLT_Mu50
  - Only use RECO muons in events
    - nRecoMuonsTrig >=2
    - nRecoMuonsTrig ==1 && nRecoMuonsTrigCen ==1 && reco_trig_ID", ireco < 0
- Selection on RECO muons
  - Eta and eta@station1 in (1.25, 2.4); loose ID; medium_ID or pt<16; tight ID or pt<64
- Rate
  - Trk_BX=0; trk_mode != trk_mode_neighbour; abs(eta)>1.25
- 2018 Emulator
  - dTh4: 1487898 events, dTh6: 1475029 events, dTh8: 1487898 events
- 2017
  - 1487898 events

SingleMu: Efficiency

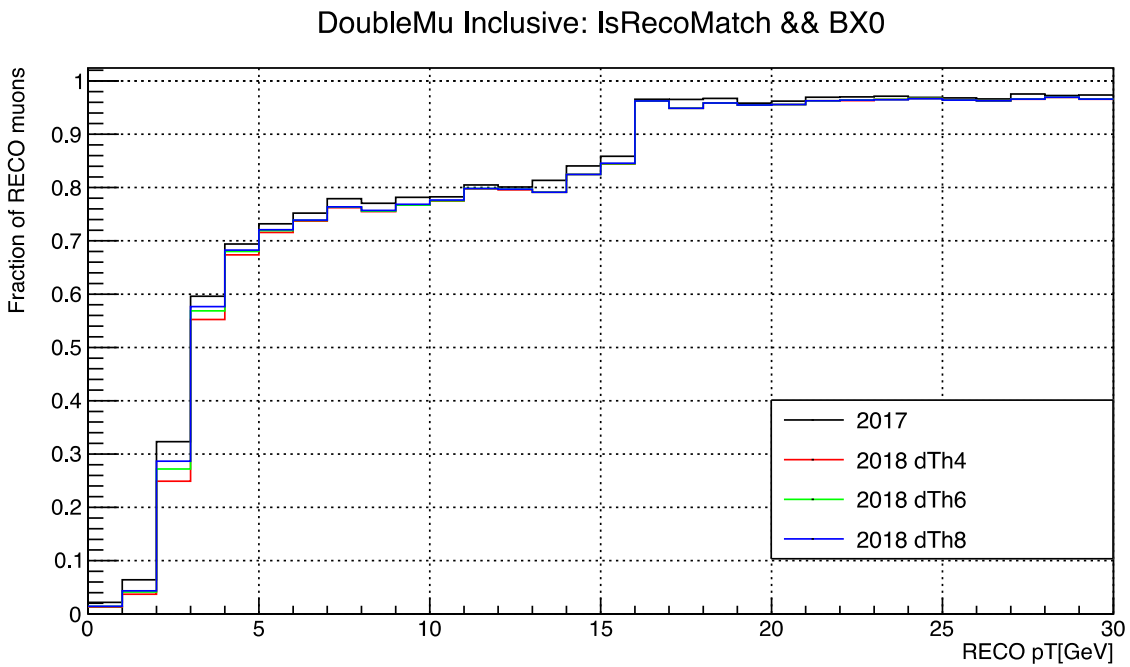


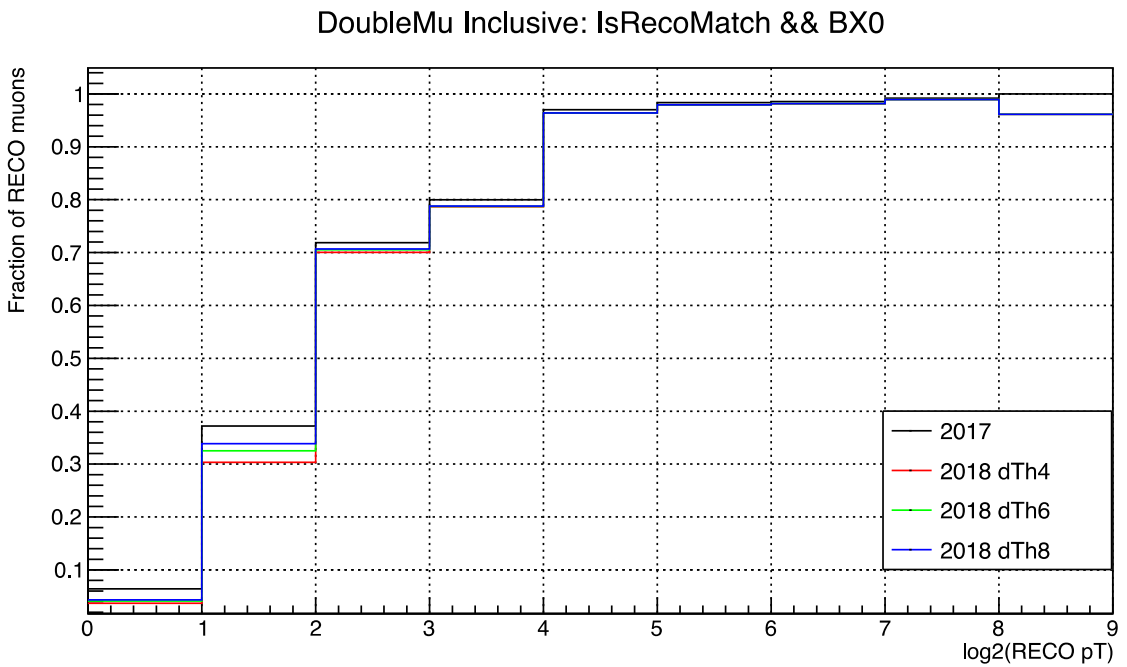


SingleMu: Rate

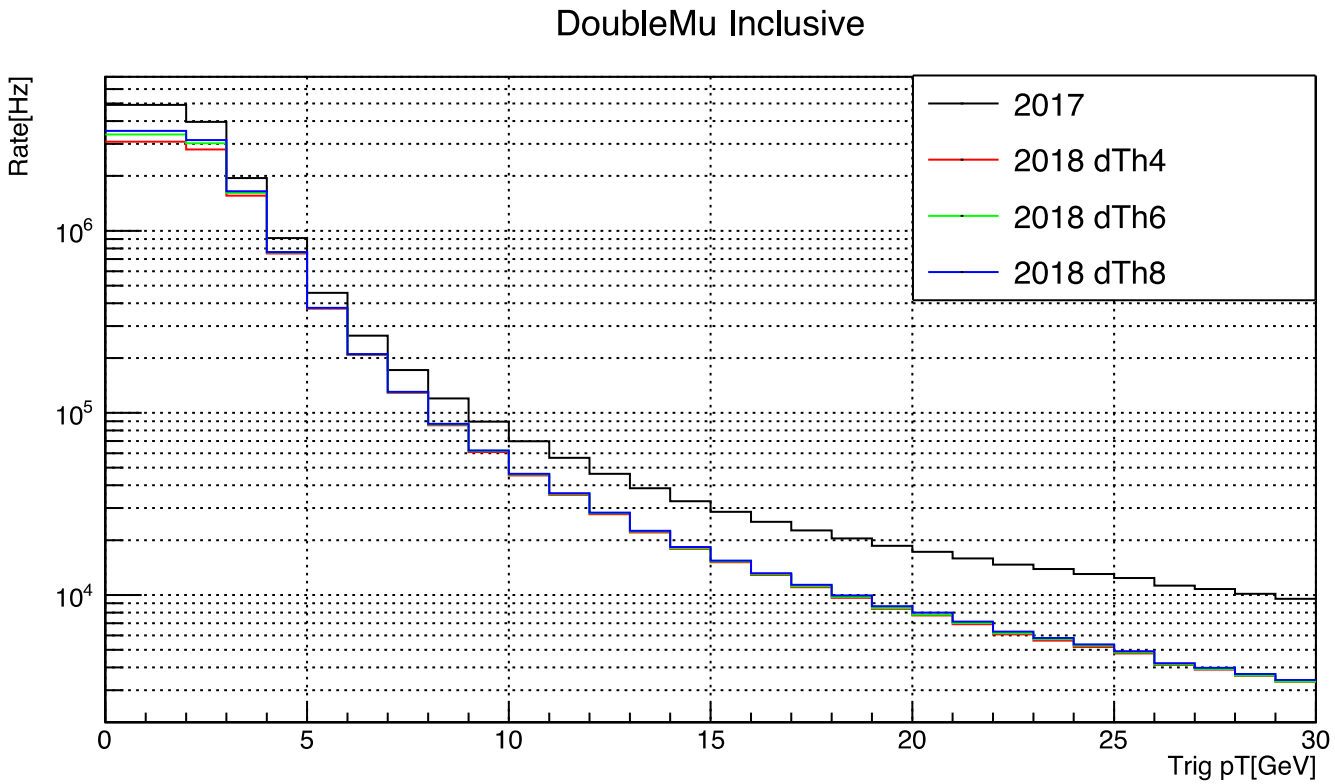


DoubleMu Inclusive: Efficiency

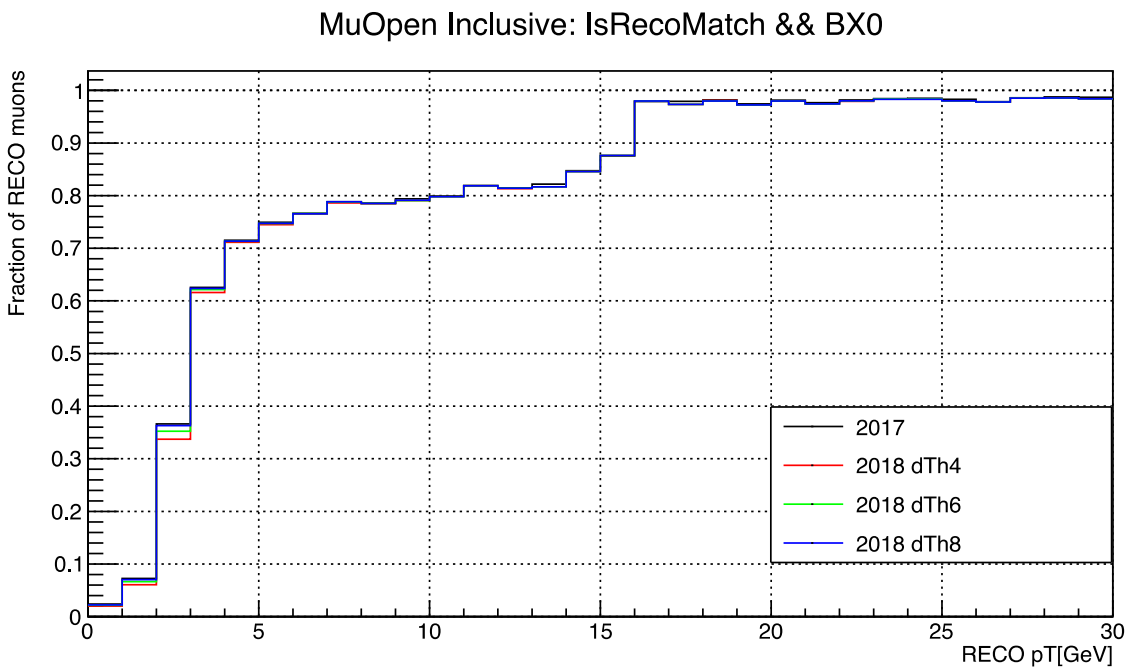


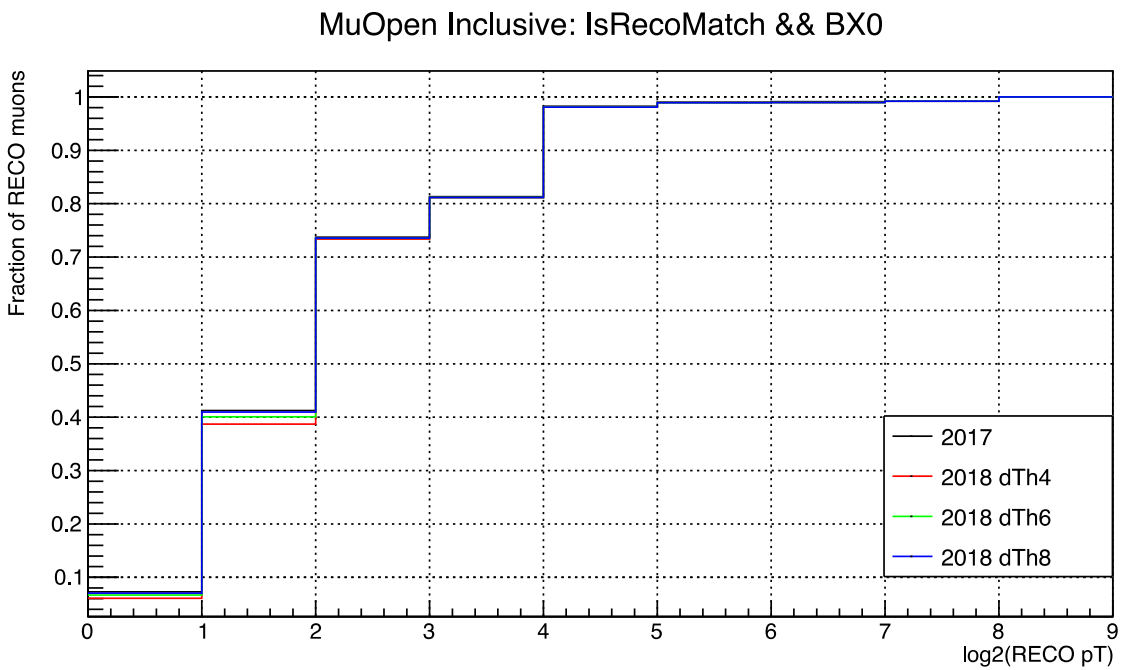


DoubleMu Inclusive: Rate

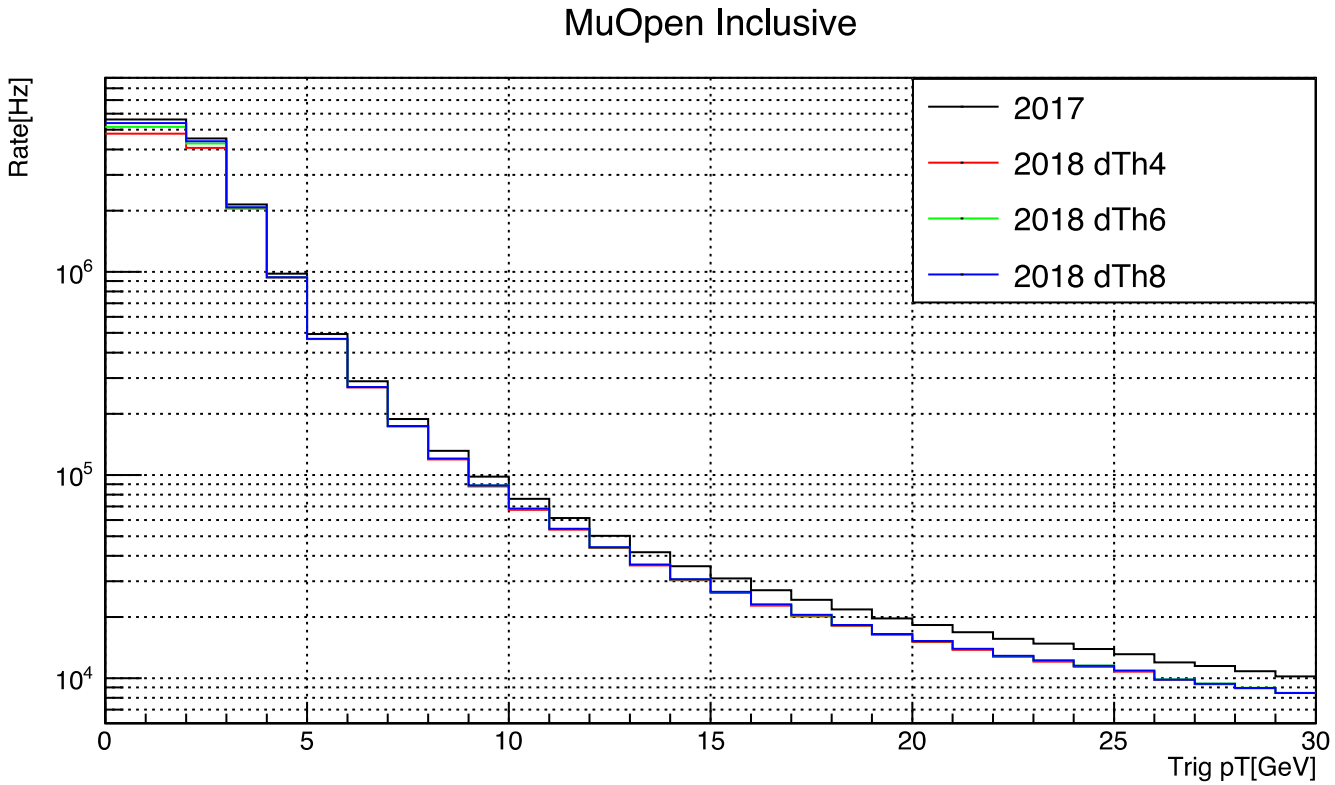


MuOpen Inclusive: Efficiency





MuOpen Inclusive: Rate



Back Up

Muon Quality

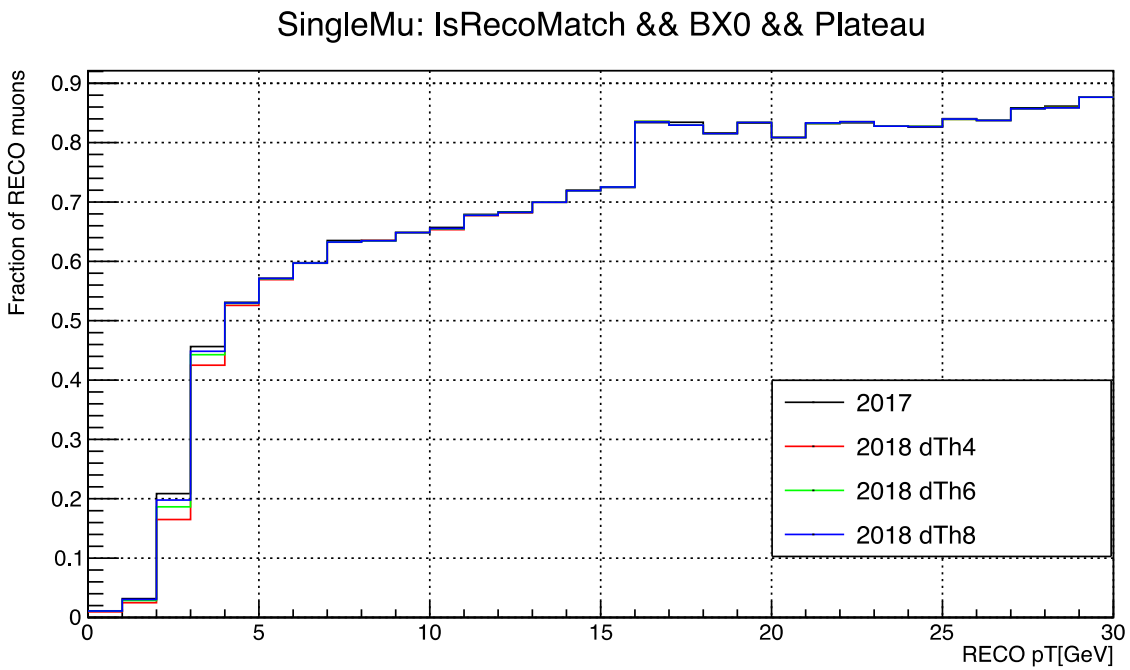
- SingleMu Quality (Q>=12)
  - EMTF mode 15, 14, 13, 11
- DoubleMu Quality (Q>=8)
  - EMTF mode 12, 10, 7
  - EMTF mode 15, 14, 13, 11
- MuOpen Quality (Q>=4)
  - EMTF mode 9, 6, 5, 3
  - EMTF mode 9, 10, 7
  - EMTF mode 15, 14, 13, 11

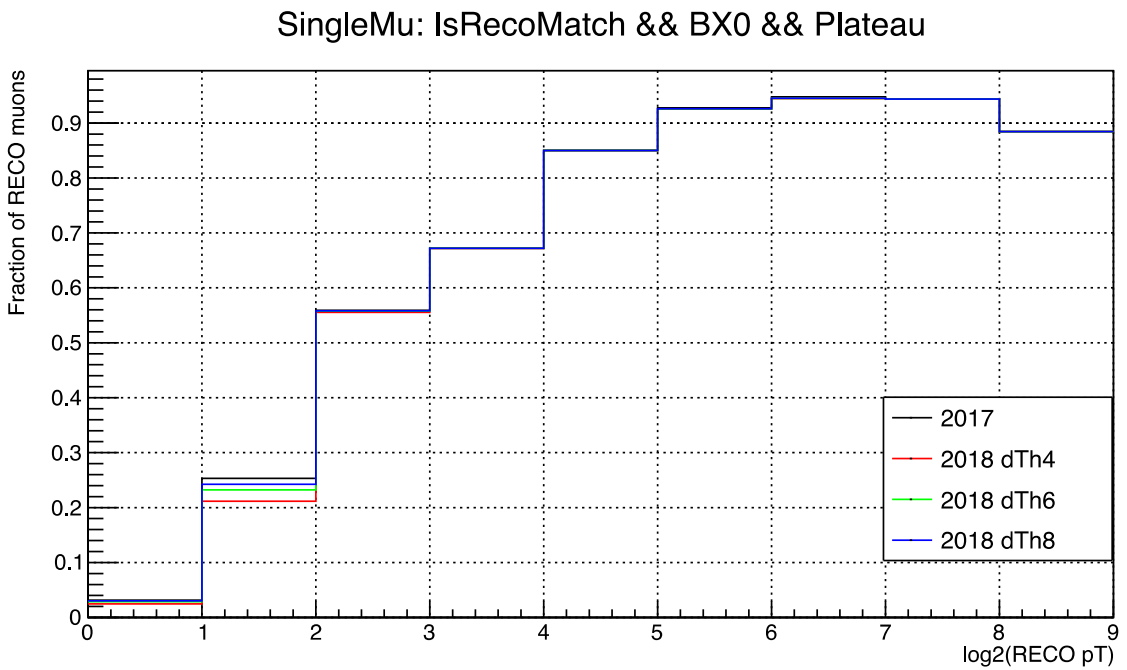
2017 Emulator

- SingleMu Quality (Q>=12)
  - EMTF mode 15, 14, 13, 11
- DoubleMu Quality (Q>=8)
  - EMTF mode 9, 10, 7
  - EMTF mode 15, 14, 13, 11
- MuOpen Quality (Q>=4)
  - EMTF mode 12, 6, 5, 3
  - EMTF mode 9, 10, 7
  - EMTF mode 15, 14, 13, 11

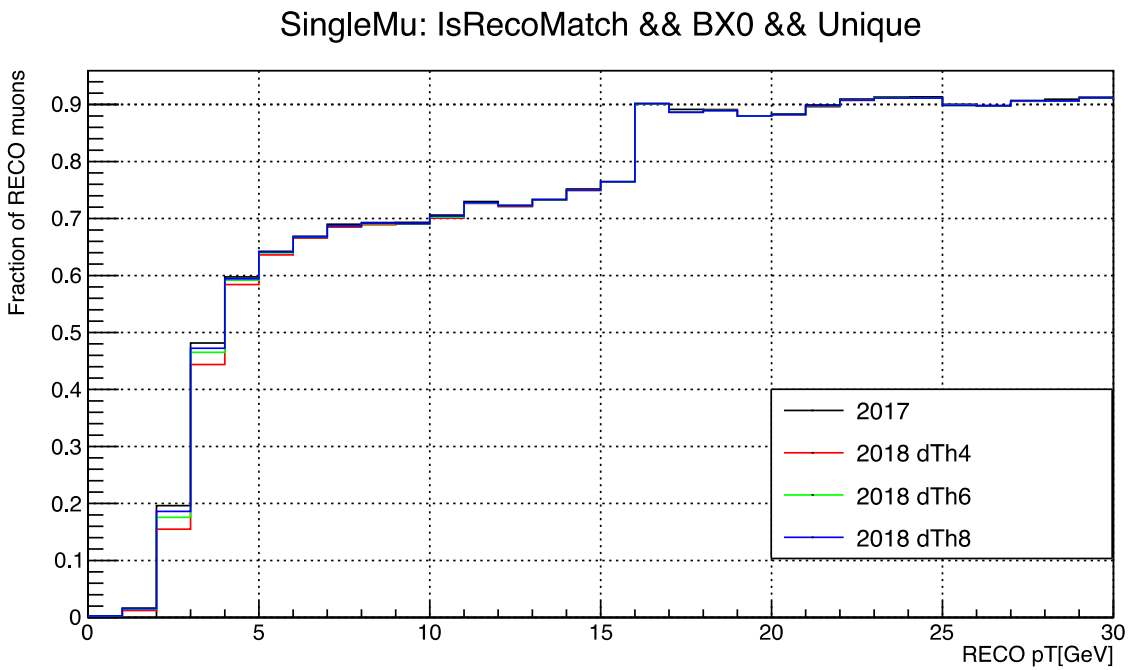
2018 Emulator

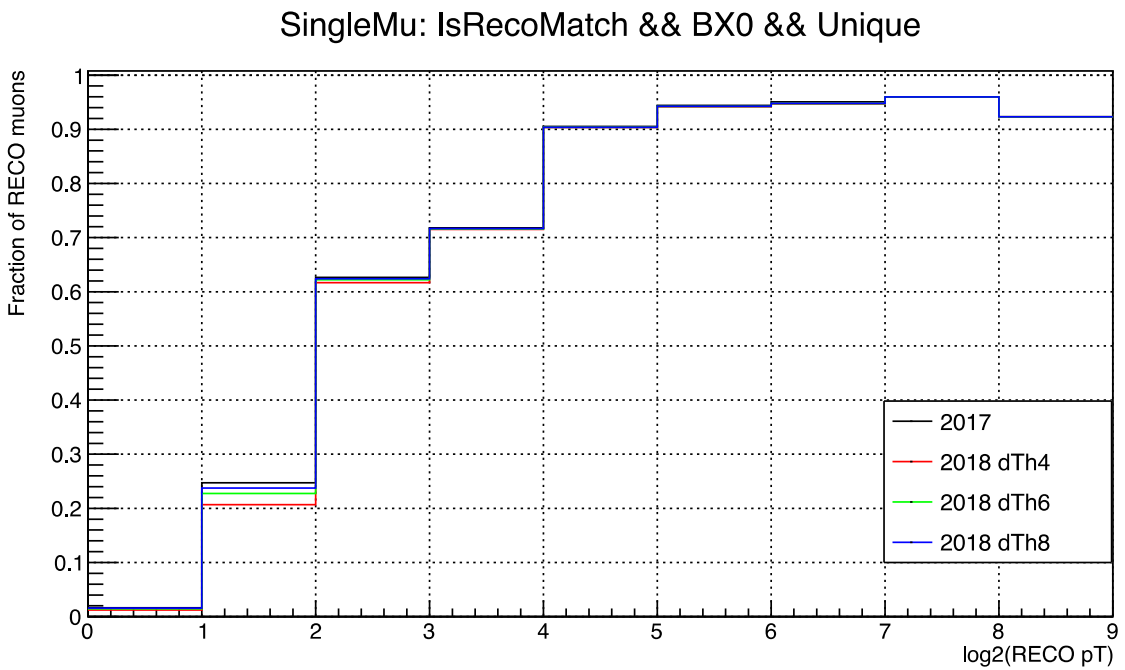
SingleMu: Plateau Efficiency



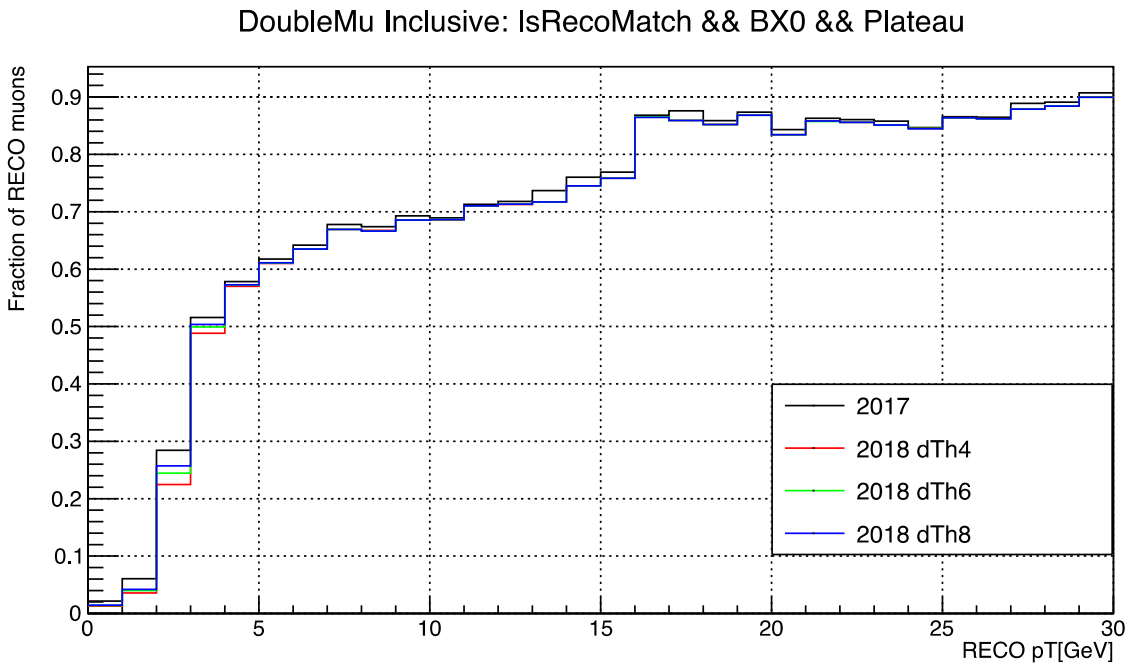


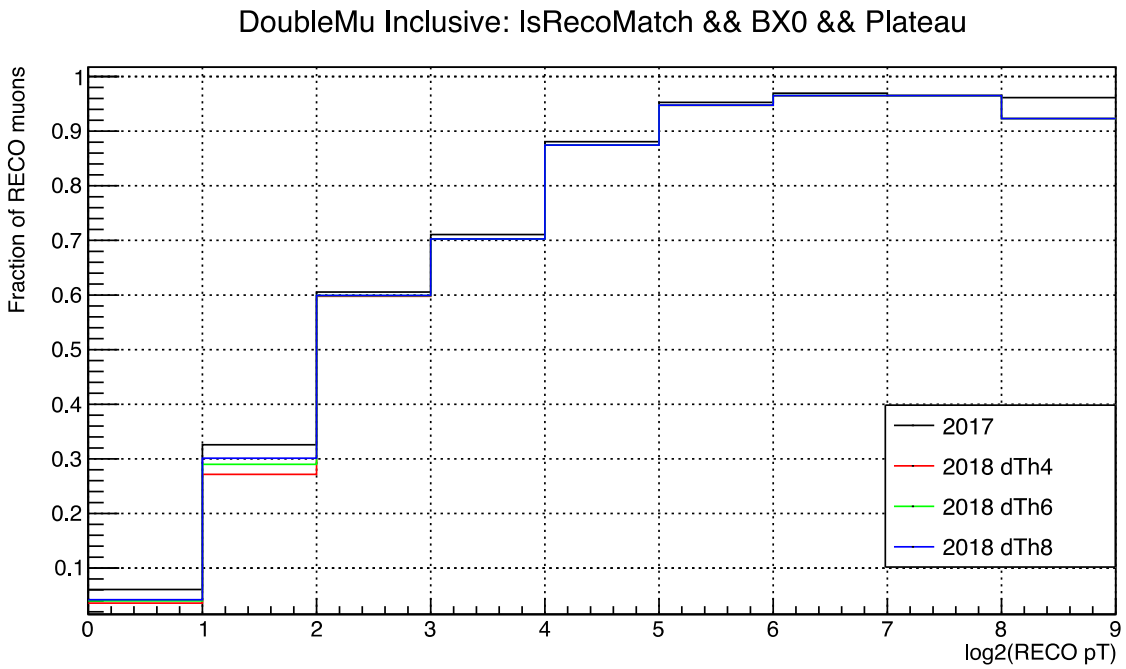
SingleMu: Efficiency (match unique)



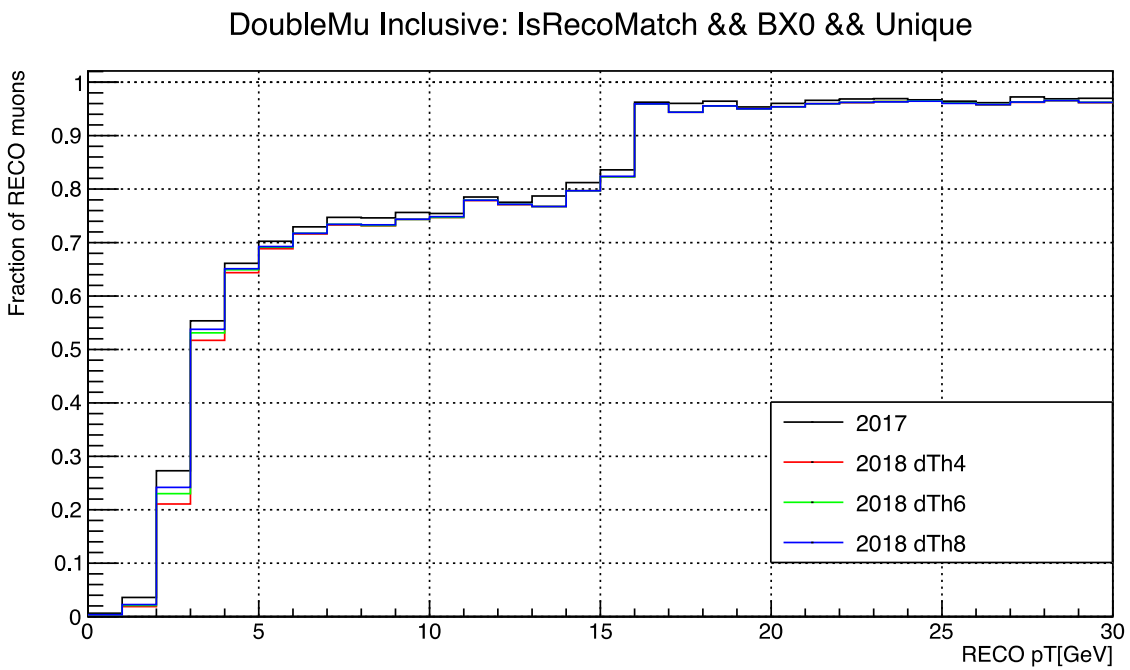


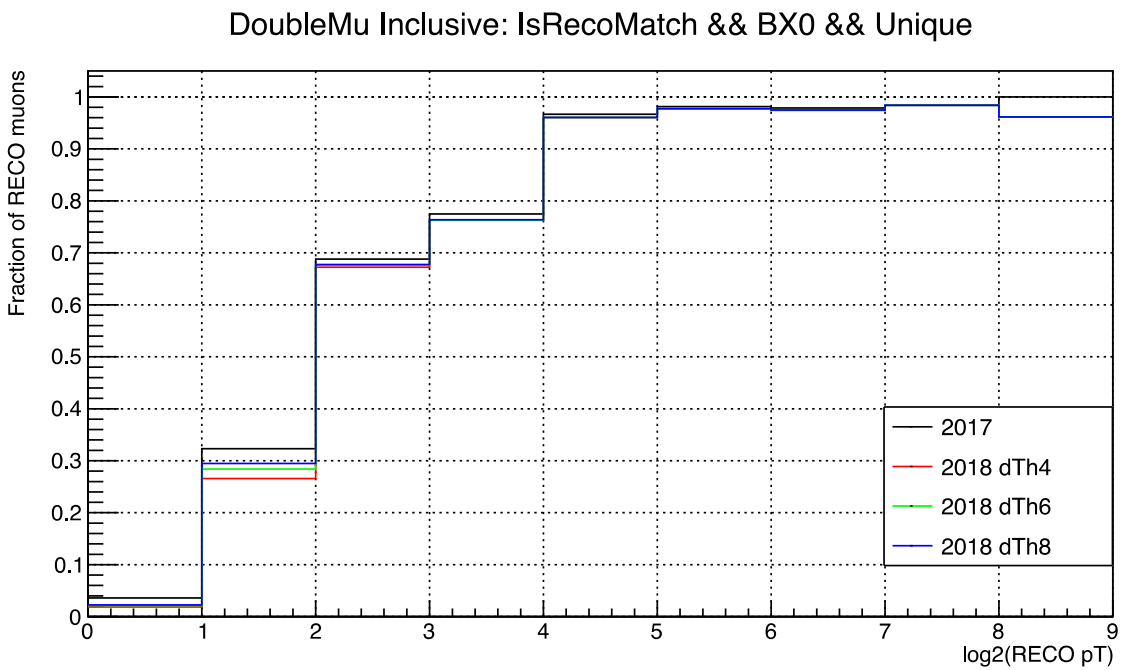
DoubleMu Inclusive: Plateau Efficiency



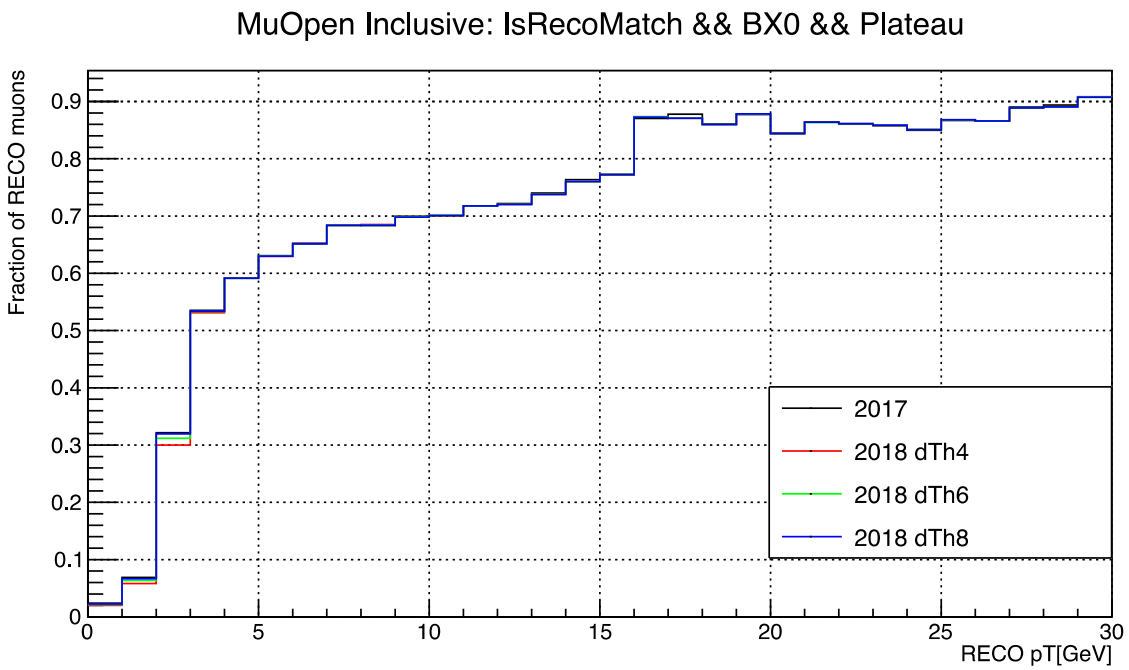


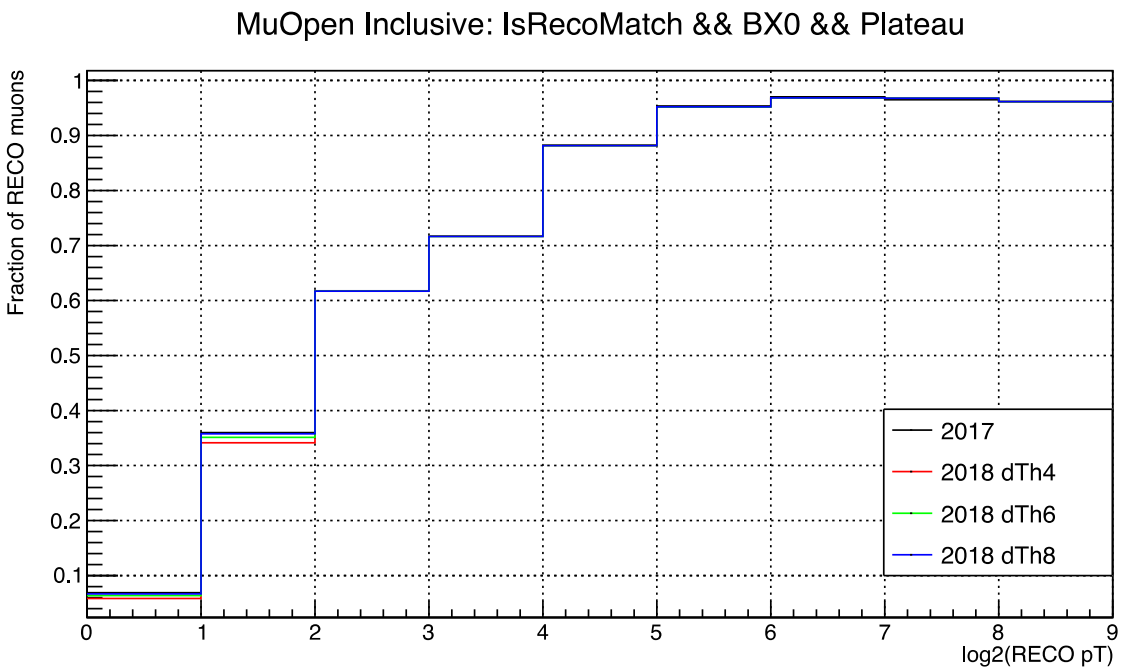
DoubleMu Inclusive: Efficiency (match unique)



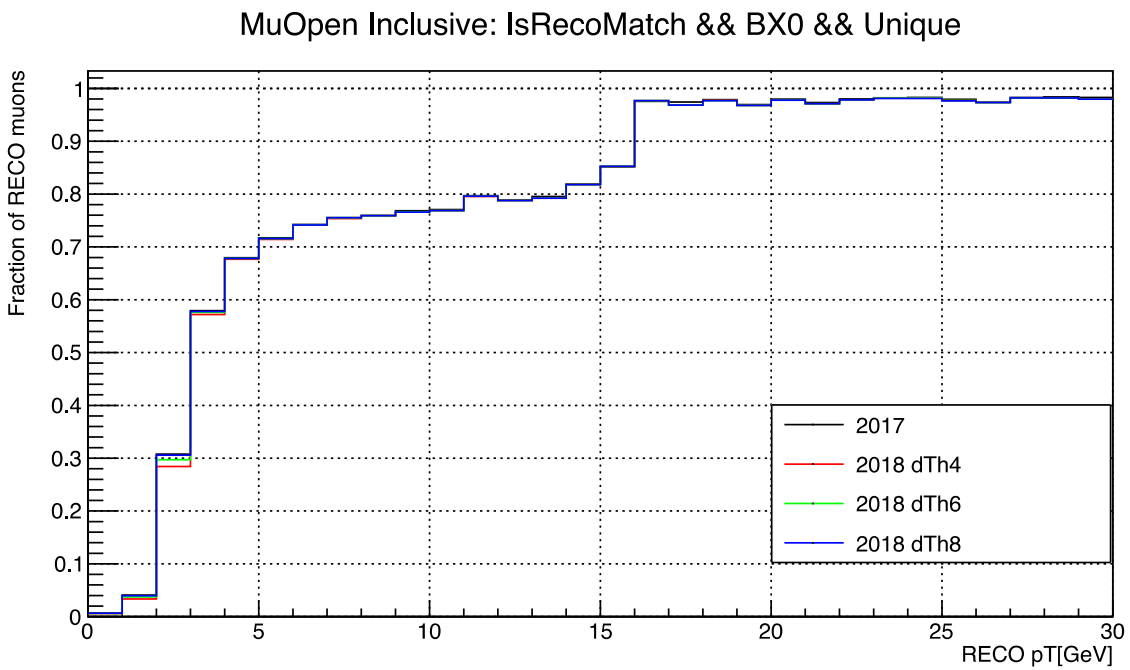


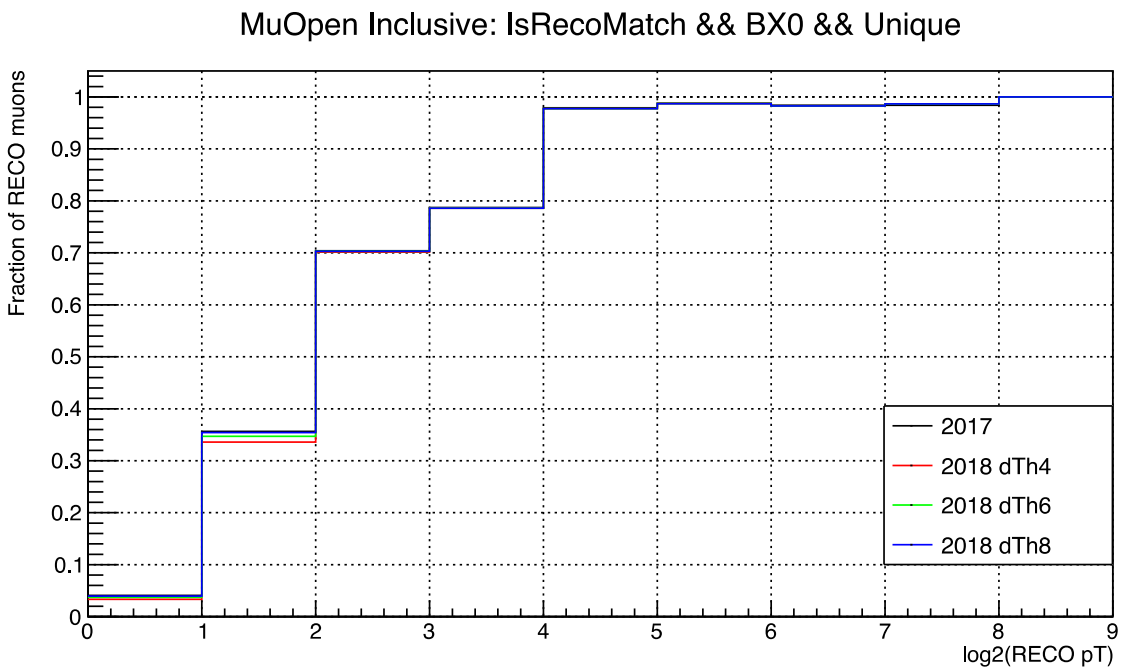
MuOpen Inclusive: Plateau Efficiency





MuOpen Inclusive: Efficiency (match unique)





Track Modes vs Stations

Mode #	Definition	Stations
15	1+2+4+8	1,2,3,4
14	2+4+8	1,2,3
13	1+4+8	1,2,4
12	4+8	1,2
11	1+2+8	1,3,4
10	2+8	1,3
9	1+8	1,4
7	1+2+4	2,3,4
6	2+4	2,3
5	1+4	2,4
3	1+2	3,4

Data Files

root://eoscms.cern.ch//store/user/abrinke1/EMTF/Emulator/ntuples/HADD/

- 2017
  - NTuple_SingleMuon_FlatNtuple_Run_306154_2018_05_07_SingleMu_2017_emul.root
  - NTuple_ZeroBias1_FlatNtuple_Run_306091_2018_05_07_ZB1_2017_emul.root
- 2018
  - NTuple_SingleMuon_FlatNtuple_Run_306154_2018_05_07_SingleMu_2018_emul_dTh4.root
    NTuple_SingleMuon_FlatNtuple_Run_306154_2018_05_07_SingleMu_2018_emul_dTh6.root
    NTuple_SingleMuon_FlatNtuple_Run_306154_2018_05_07_SingleMu_2018_emul_dTh8.root
  - NTuple_ZeroBias1_FlatNtuple_Run_306091_2018_05_07_ZB1_2018_emul_dTh4.root
    NTuple_ZeroBias1_FlatNtuple_Run_306091_2018_05_07_ZB1_2018_emul_dTh6.root
    NTuple_ZeroBias1_FlatNtuple_Run_306091_2018_05_07_ZB1_2018_emul_dTh8.root