

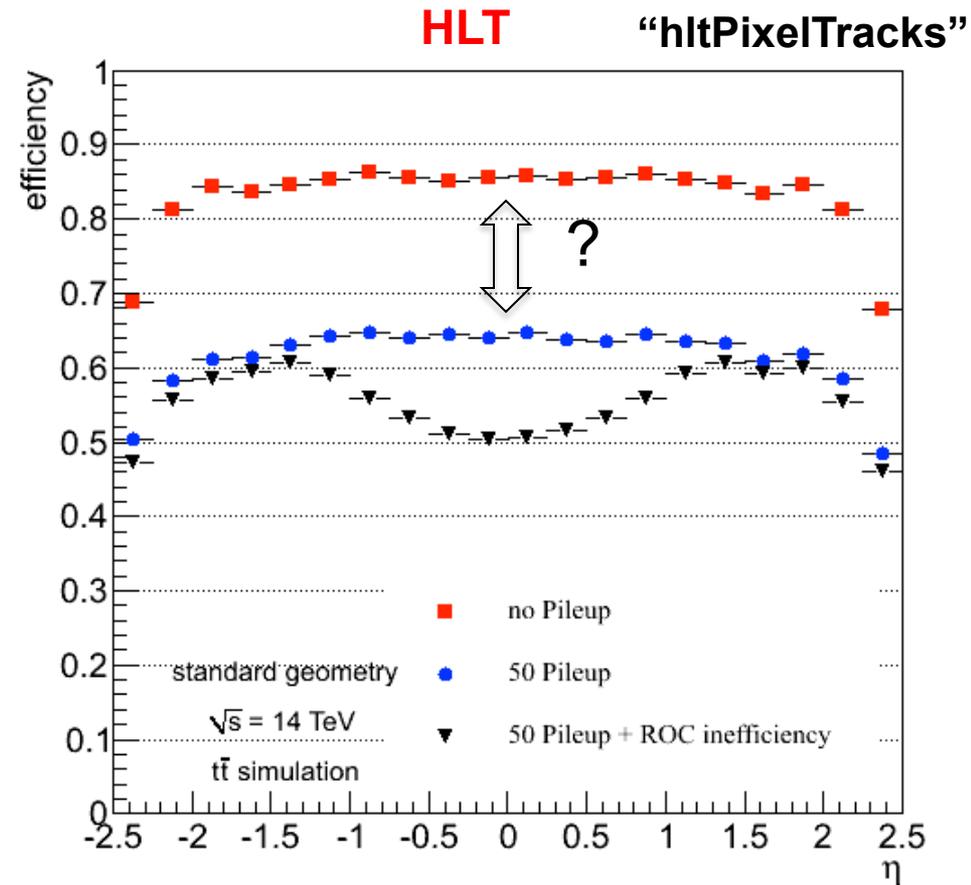
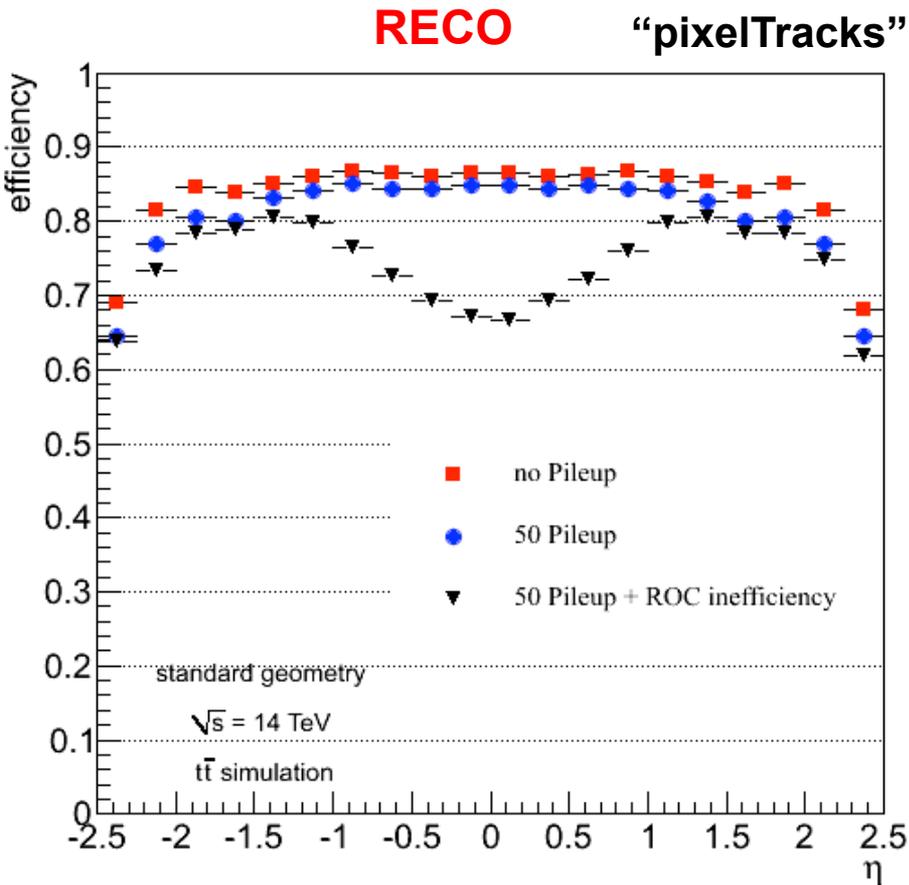
Datasets

- **CMSSW version:**
- CMSSW_4_2_8_SLHCstd2 (Standard)
- CMSSW_4_2_8_SLHCtk3 (Phase1)

- **Standard geometry:**
- **ttbar:**
- /RelValTTbar_Tauola/CMSSW_4_2_3_patch3-DESIGN42_V11_110612_special-v1/GEN-SIM
- **Muon:**
- /RelValFourMuPt_1_200/CMSSW_4_2_3_patch3-DESIGN42_V11_110612_special-v1/GEN-SIM

- **Phase1 geometry:**
- **ttbar:**
- /TTbar_Tauola_14TeV/Summer12-DESIGN42_V17_SLHCTk-v1/GEN-SIM

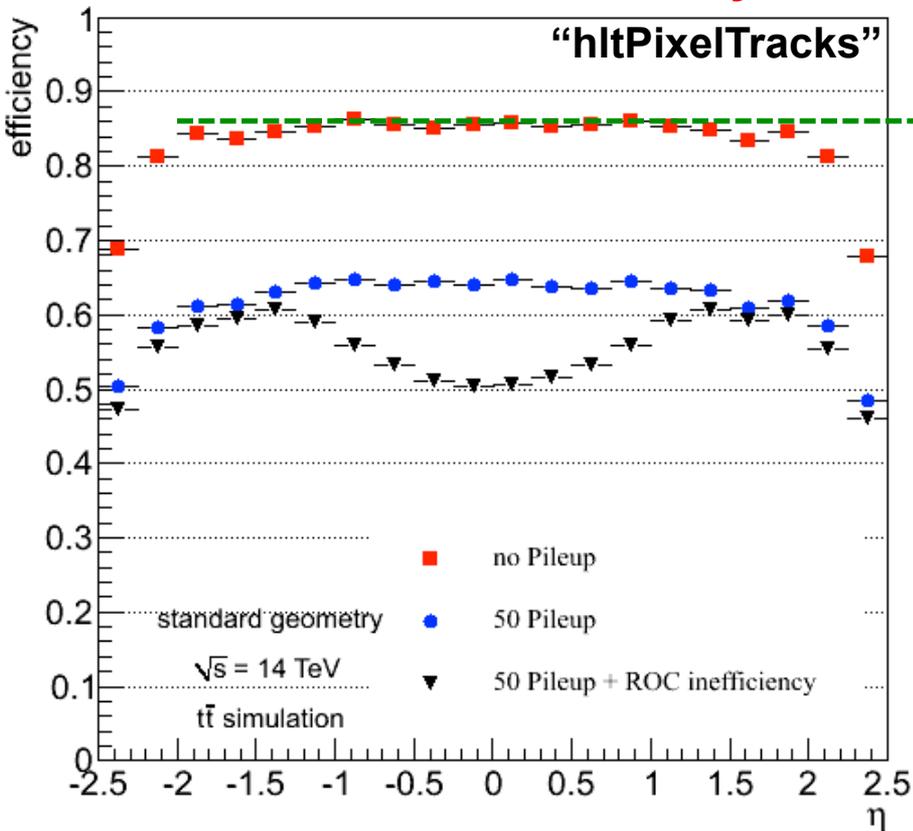
Efficiency in Std Geometry (ttbar) (RECO vs. HLT)



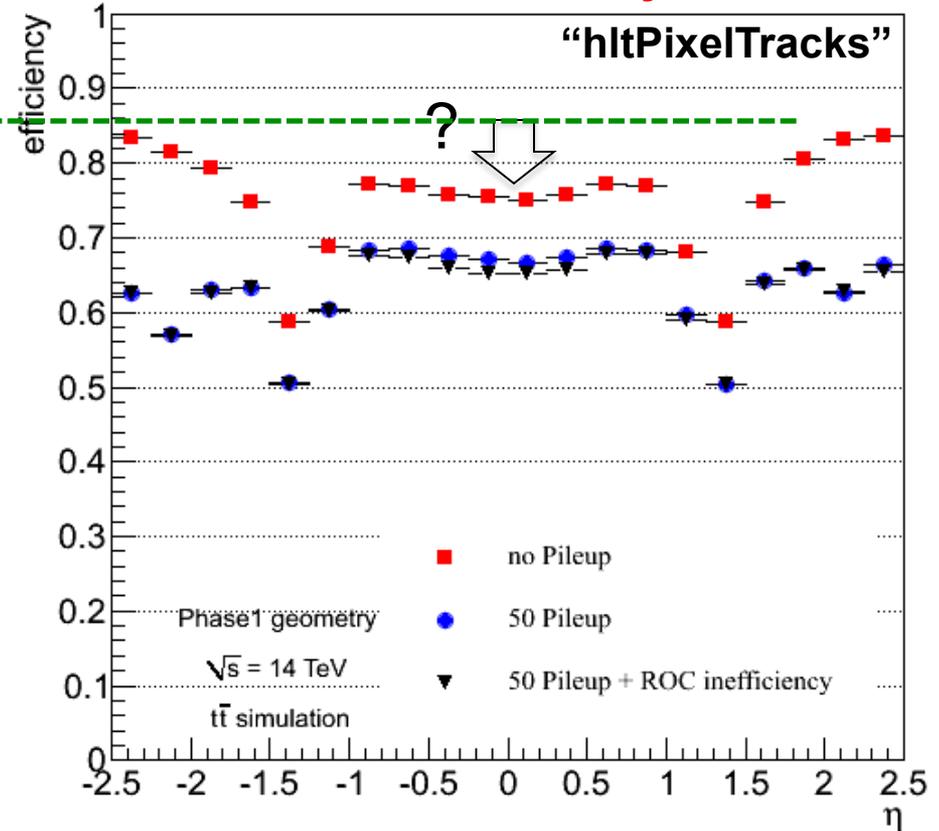
□ Difference in efficiency for 50 PU case between RECO and HLT not yet understood

hltPixelTracks Efficiency vs. η

Standard Geometry



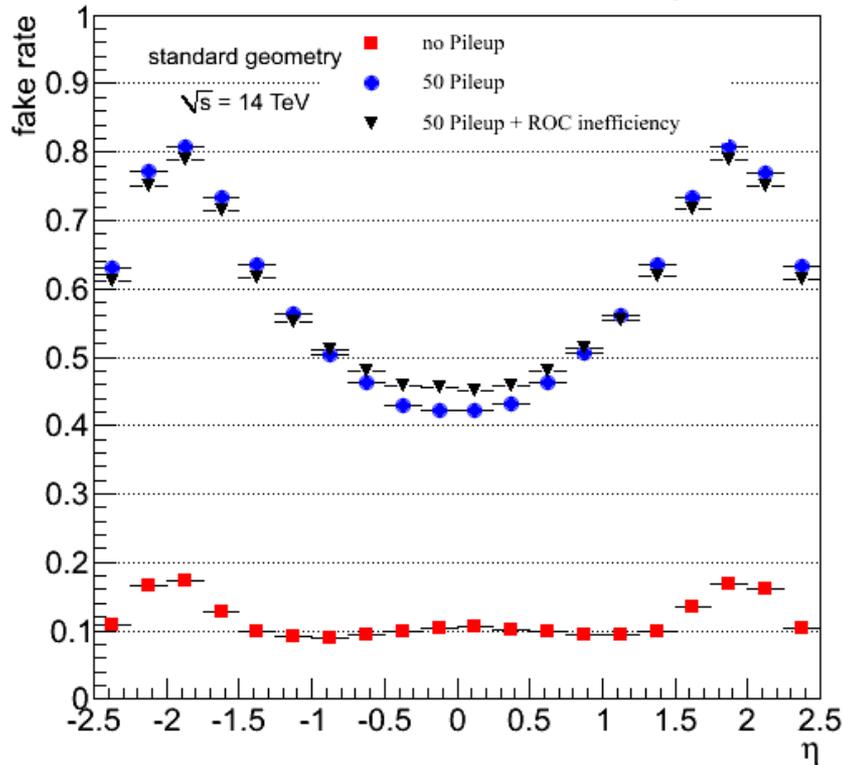
Phase1 Geometry



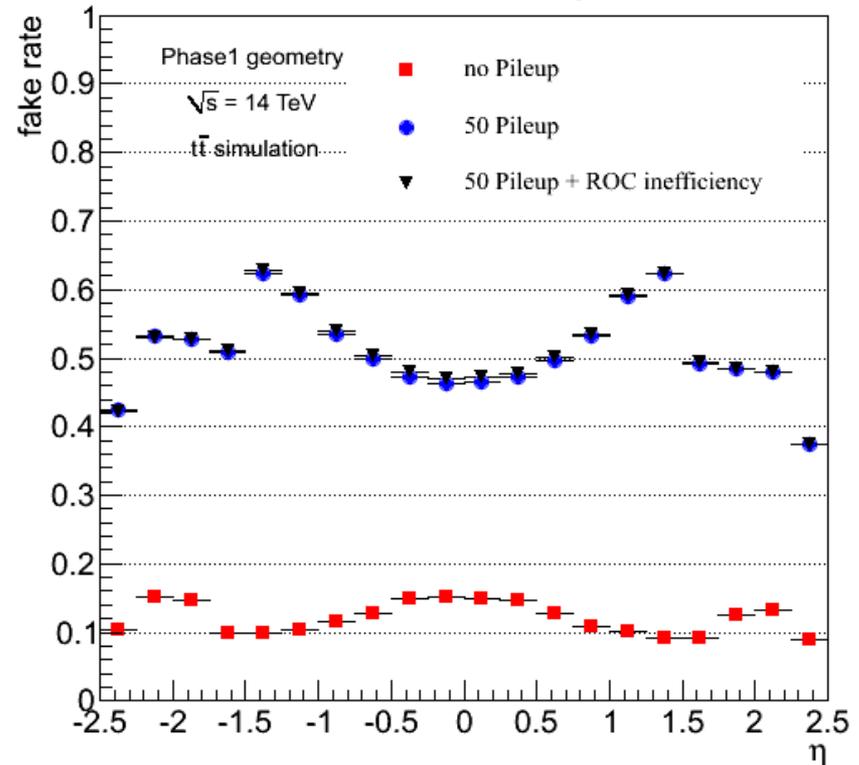
- ❑ No PU: Efficiency for Std Geo is 85% and Phase1 is < 80% !!!!
- ❑ With 50 PU: Efficiency for Std Geo is 65% and Phase1 is ~ 70% (for central)
- ❑ With 50 PU + 20% ROC inefficiency: for Std Geo – efficiency visibly lower but in Phase1 – not much different than 50 PU

hltPixelTracks Fake rates vs. η

Standard Geometry



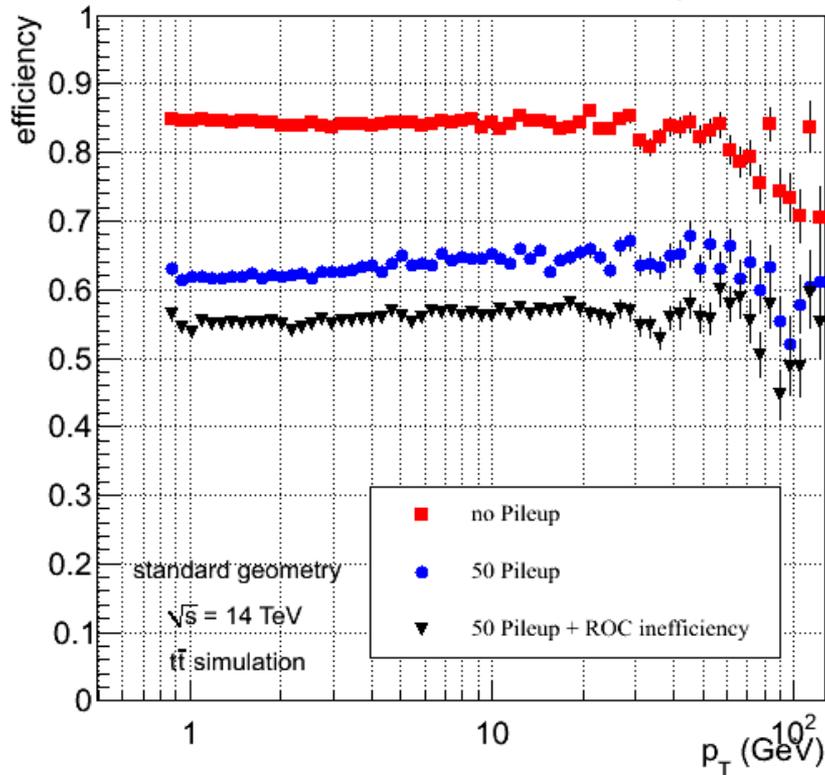
Phase1 Geometry



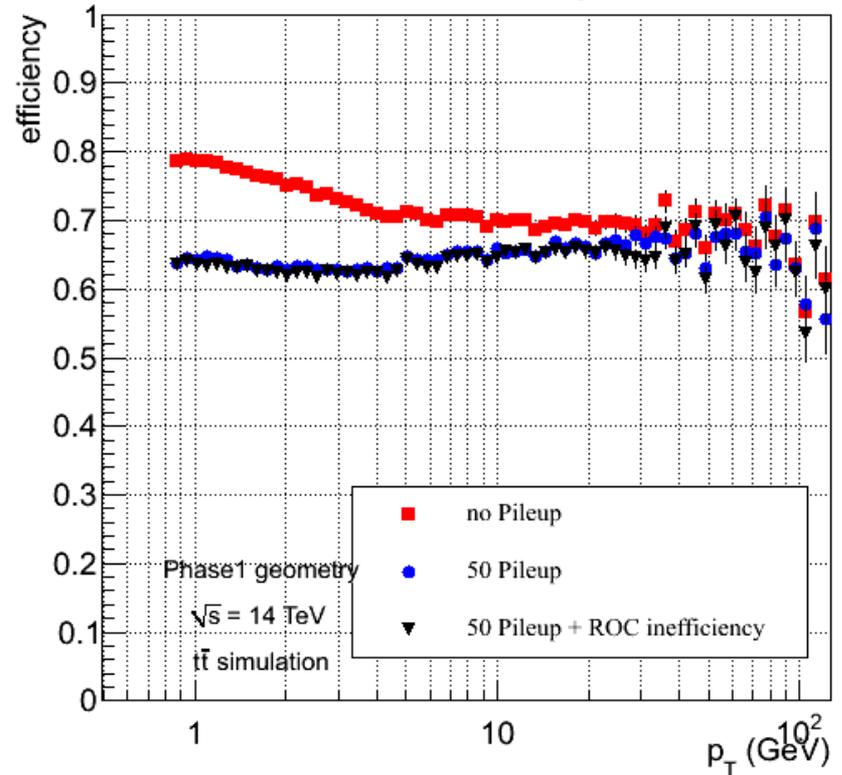
- ❑ Fake rates are lower for Phase1 towards the end cap
- ❑ But for No PU case fake rate is not better for Phase1

hltPixelTracks Efficiency vs p_T

Standard Geometry

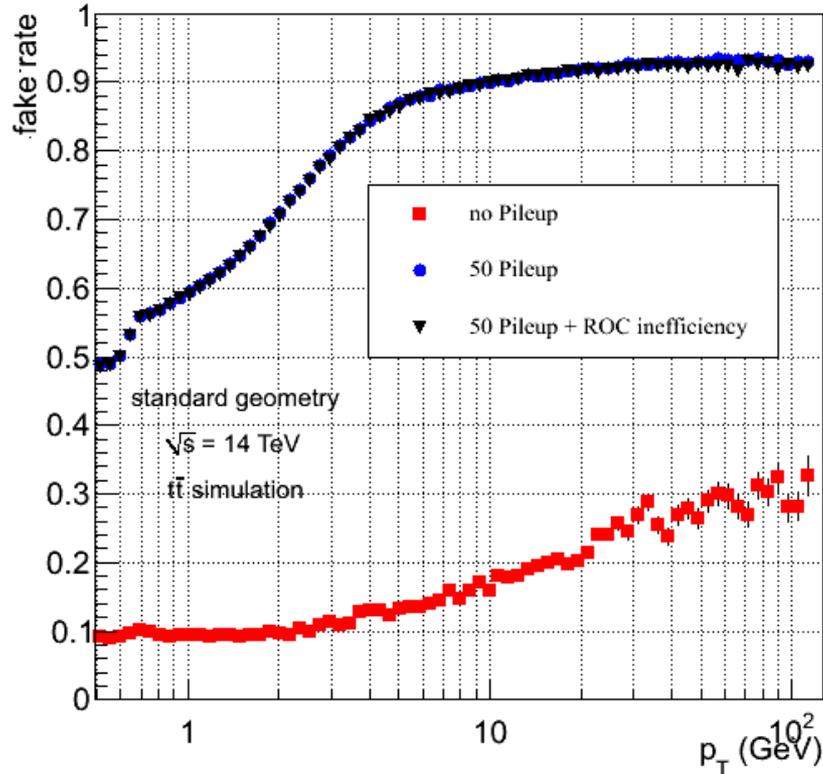


Phase1 Geometry

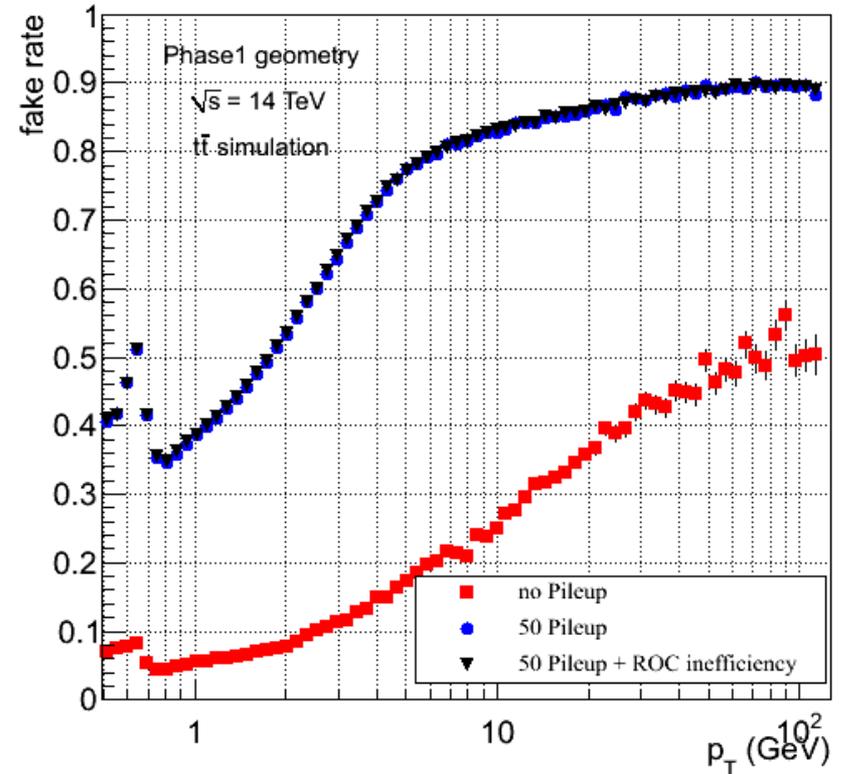


hltPixelTracks Fake rates vs p_T

Standard Geometry



Phase1 Geometry



Additional Slides

Investigating the lower efficiency of Phase1

In the main config file for Phase1:

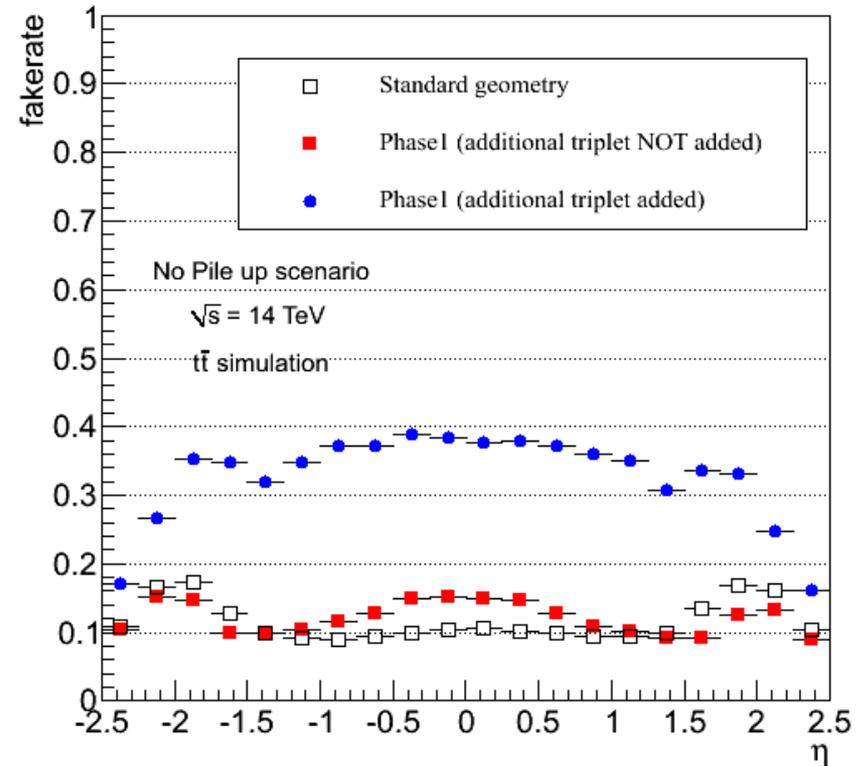
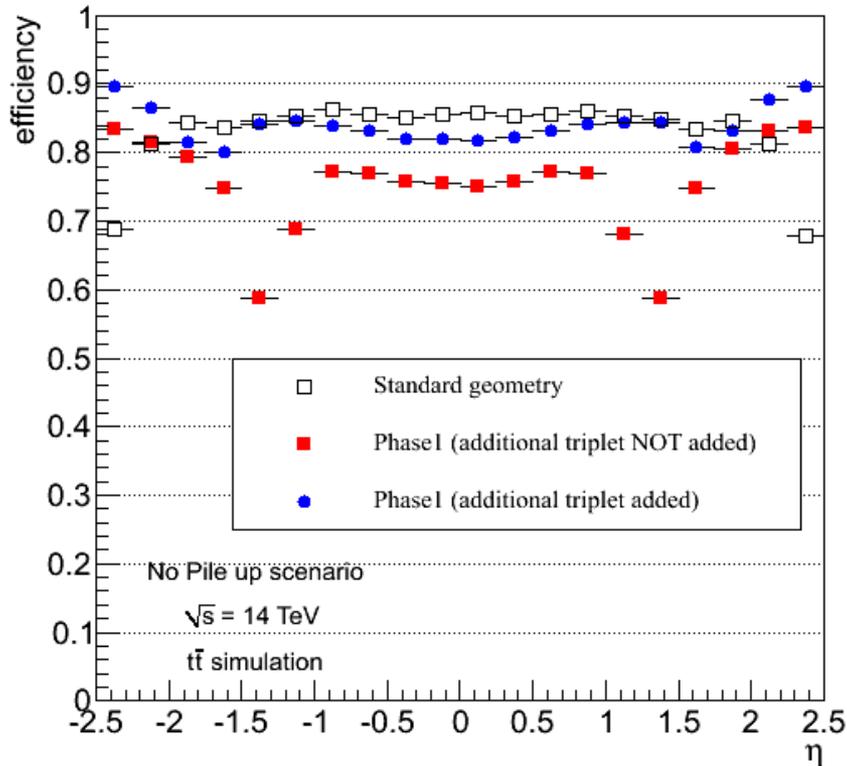
```
process.load('RecoPixelVertexing.PixelTriplets.quadrupletseedmerging_cff')
```

```
SeedMergerPSet = cms.PSet(  
    layerListName = cms.string('PixelSeedMergerQuadruplets'),  
    addRemainingTriplets = cms.bool(True),  
    mergeTriplets = cms.bool(True),  
    ttrhBuilderLabel = cms.string('hltESPTTRHBuilderPixelOnly')  
)
```

```
process.hltPixelTracks.SeedMergerPSet.addRemainingTriplets = cms.bool( True )
```

- If “True”, the seed merger will add all the triplets to the seed collection which could not be merged.
- For the results shown so far I kept it as “False”
- In the following slides I switched that to “True” and compared the efficiency/fakerate
 - Additional triplet NOT added ⇔ **False**
 - Additional triplet added ⇔ **True**

Efficiency and Fake rate for htpixeltracks



- Efficiency gets much better by adding those additional triplets which could not be merged, **But** Fake Rate is seen to be much higher.
- Not sure which one should be implemented.