# Track kaboom validation

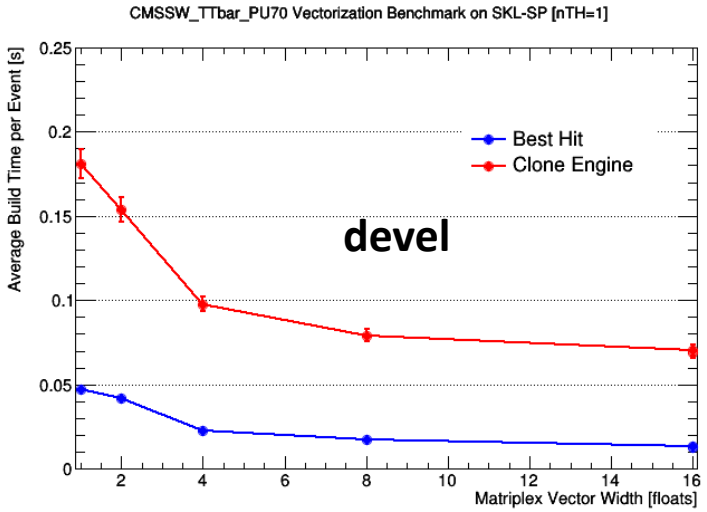
Kevin, via plots from Matevž and Allie

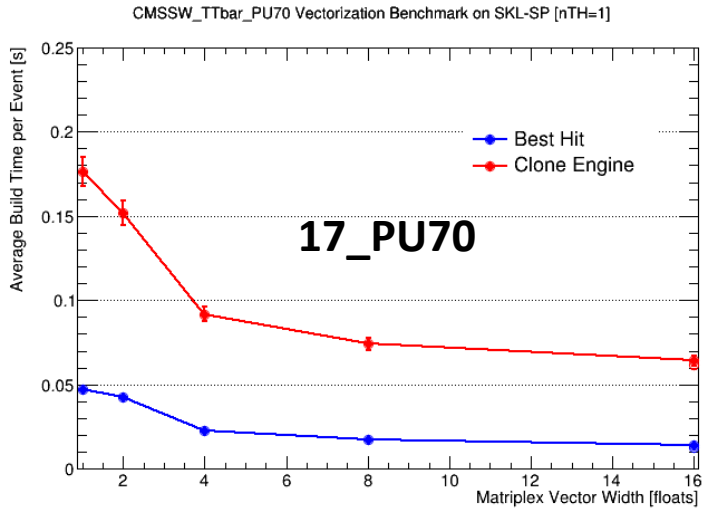
HEAD of devel
Track Kaboom: PU70 (2017 Seeds)
Track Kaboom: PU70 (2018 Seeds)
Track Kaboom: PU50 (2018 Seeds)

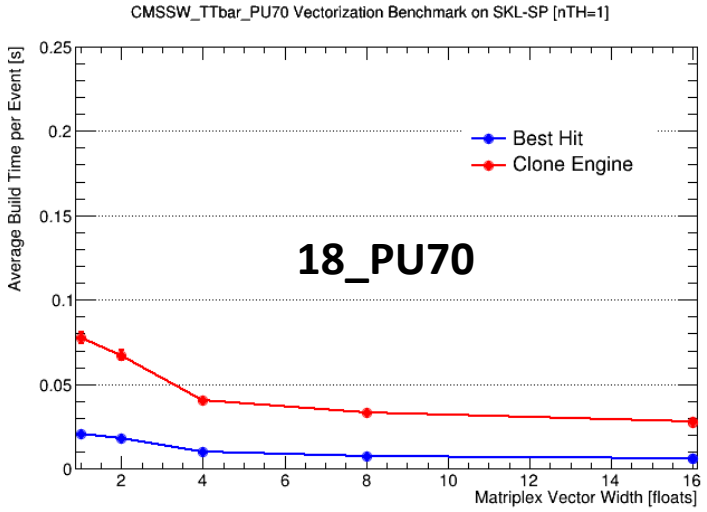
# Legend of labels for following plots

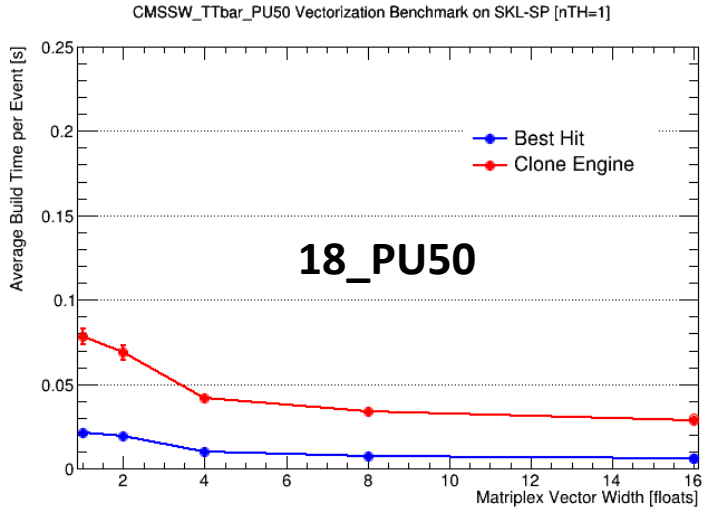
- **devel**: current status of mkFit [ttbar PU 70 with 2017 geometry + seeds]
  - Latest change to repo is switch to 7.5 hit bonus, using old 2017 ttbar + PU70 sample
- **17_PU70**: Track Kaboom [ttbar PU 70 with 2017 geometry + seeds]
  - Using old 2017 sample, therefore missing updates to binary file with charge clusters, etc. (does not affect tracking)
- **18_PU70**: Track Kaboom [ttbar PU 70 with 2018 geometry + seeds]
  - Temporary sample with new data format for charge clusters, less than 500 events on file
  - 2018 sample has 40% fewer quadruplets than 2017!
- **18_PU50**: Track Kaboom [ttbar PU 50 with 2018 geometry + seeds]
  - Full stats sample with new data format

# Build time vs nVU



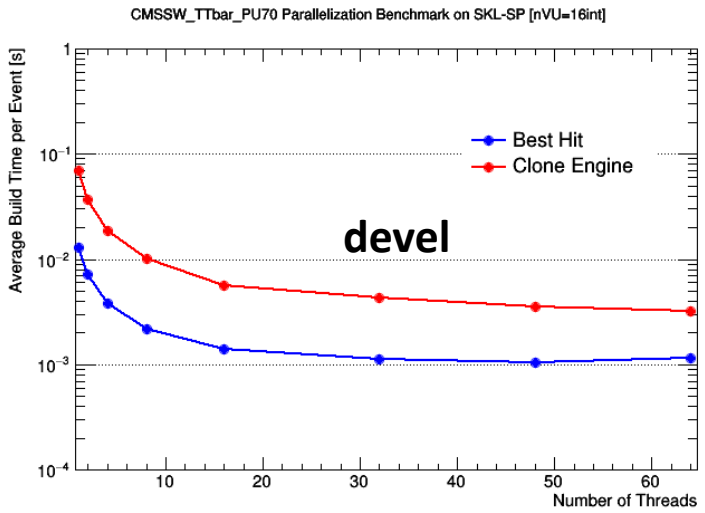



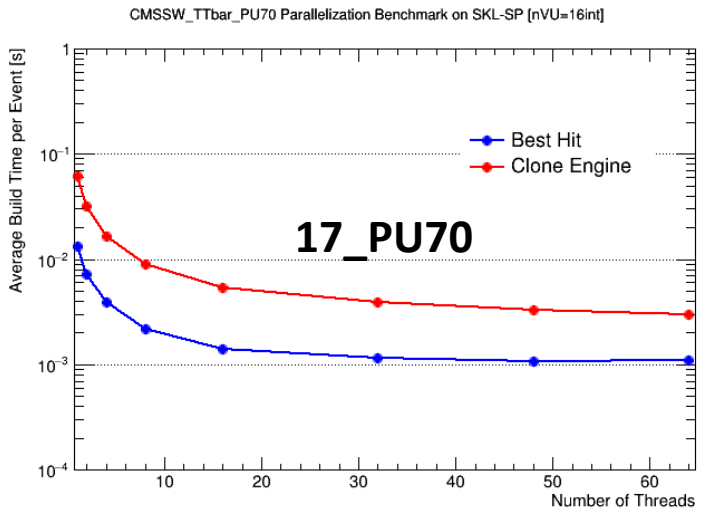



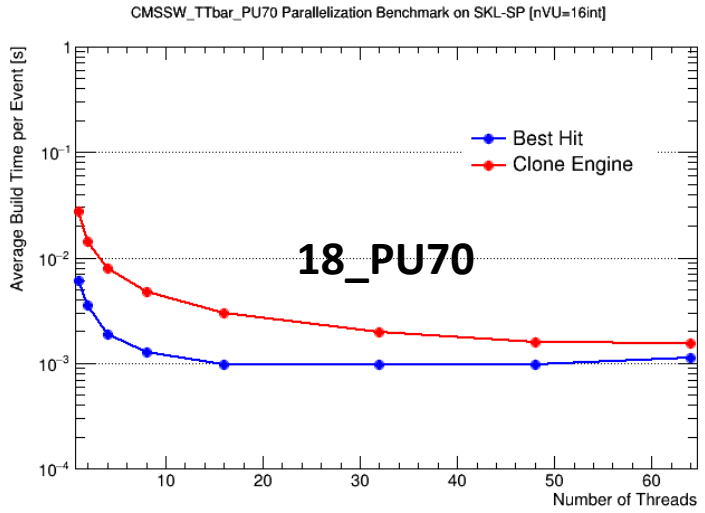



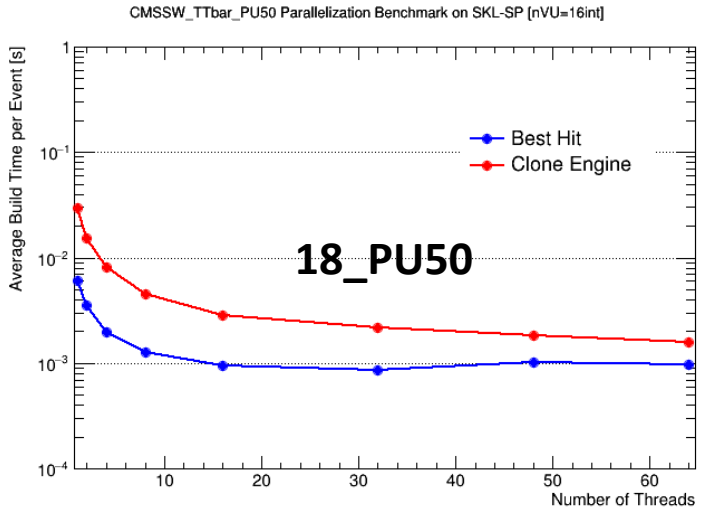

- 10% speedup from Track Kaboom vs. devel (top row)
- With 40% fewer seeds, average build time falls by nearly the same amount (17_PU70 vs 18_PU70)
- PU50 ~ PU70 in avg. time

# Build time vs nTH



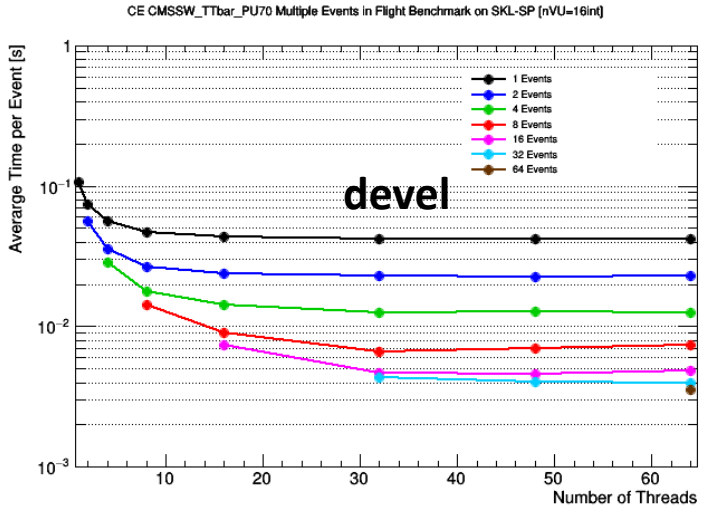



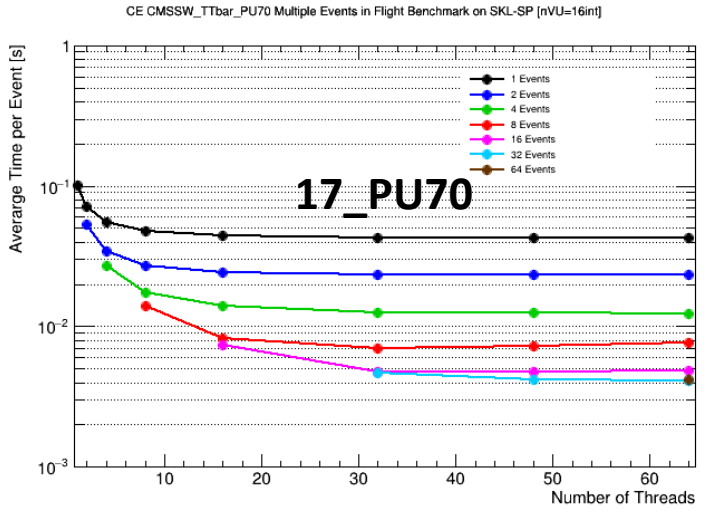



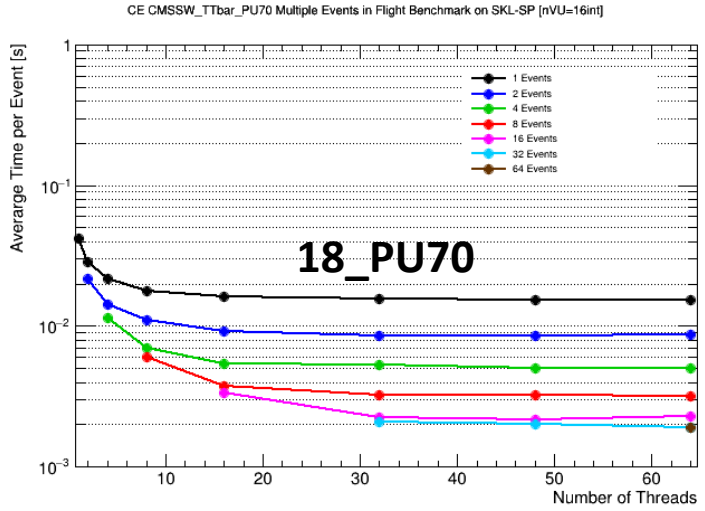



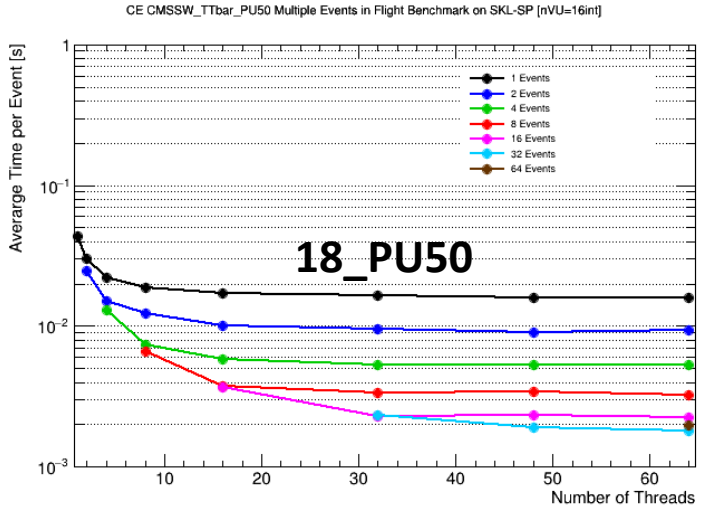

- 10% speedup from Track Kaboom vs. devel (top row)
- With 40% fewer seeds, average build time falls by nearly the same amount (17_PU70 vs 18_PU70)
- PU50 ~ PU70 in avg. time
  - Although perhaps slightly longer times for PU50 due to more seeds produced?

# MEIF time vs nTH



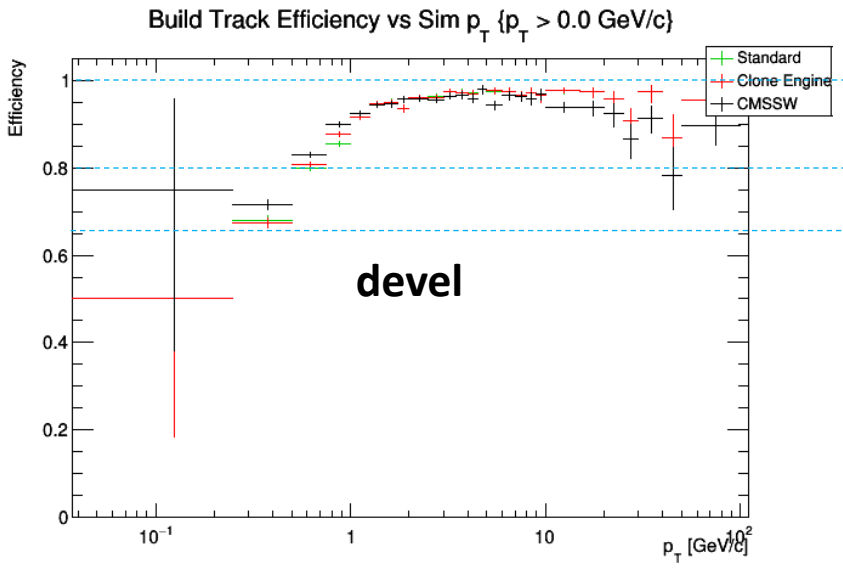



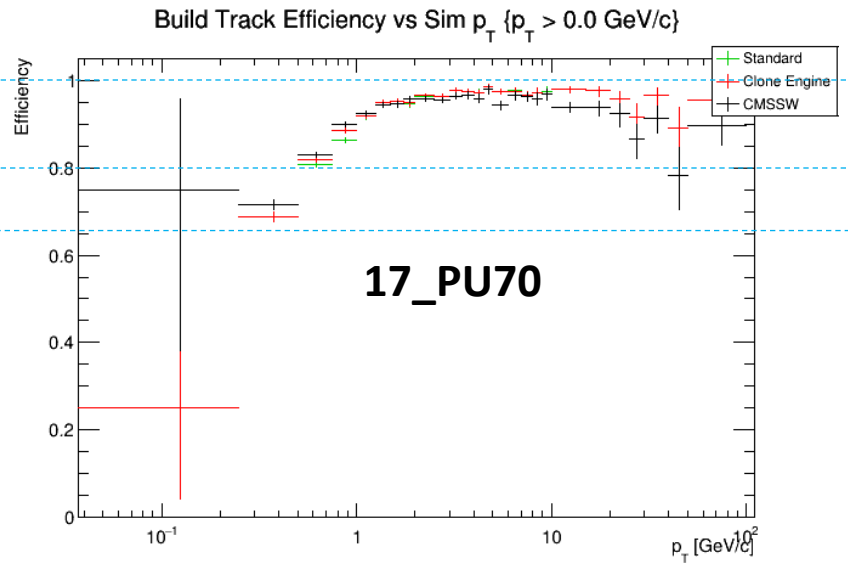



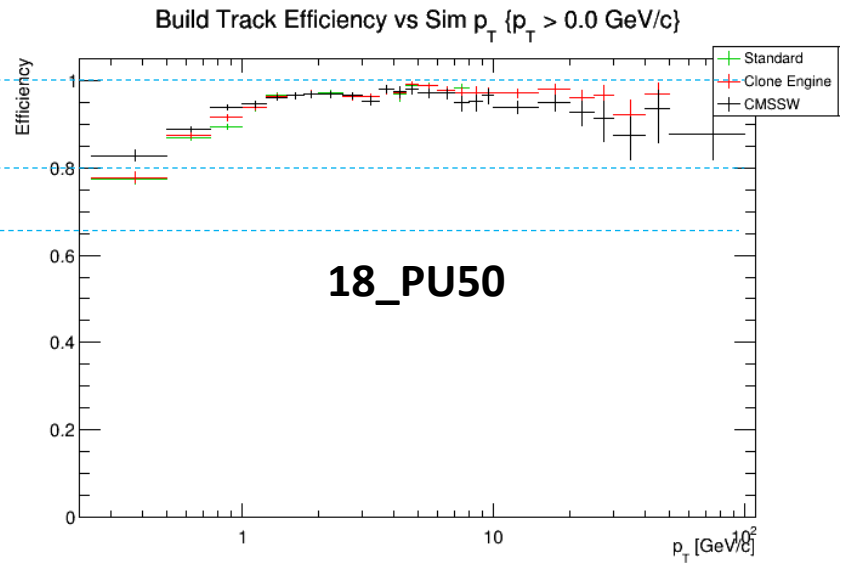




- 10% speedup from Track Kaboom vs. devel for nTH=1, but throughput might even be less…
- With 40% fewer seeds, average build time falls by nearly the same amount (17_PU70 vs 18_PU70)
- PU50 ~ PU70 in avg. time
  - Although perhaps slightly longer times for low nEV for PU50 due to more seeds produced?

# Eff. vs. $p_T$



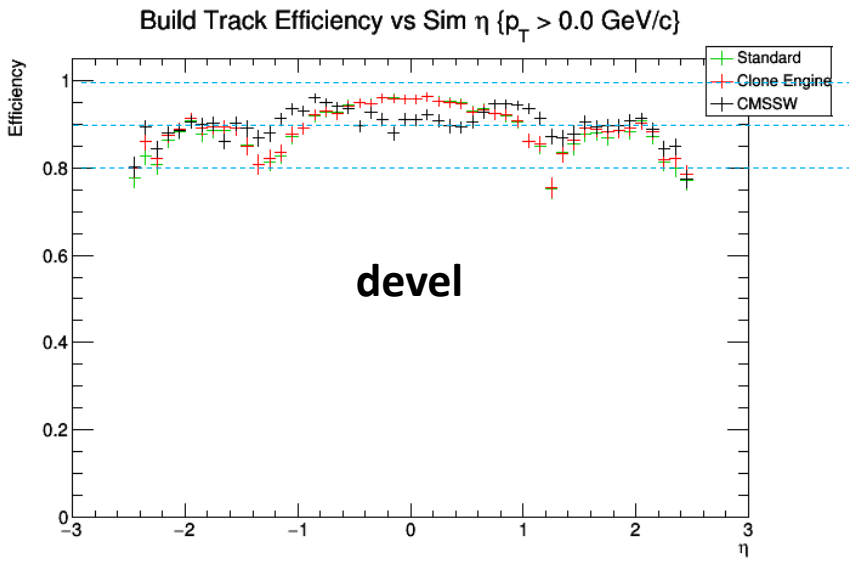



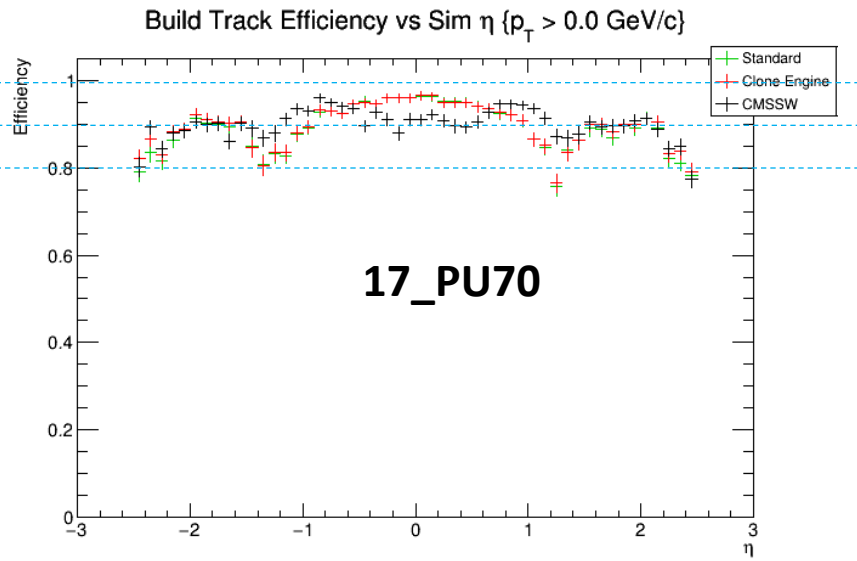



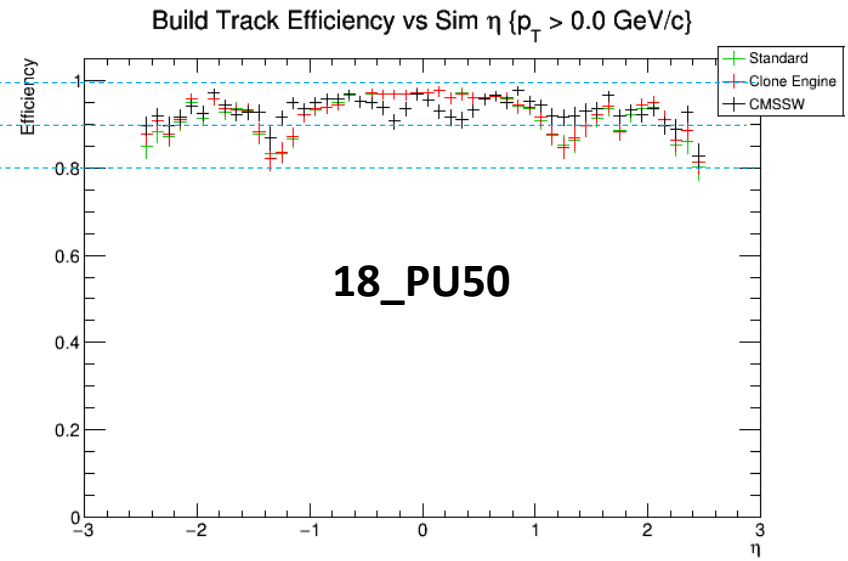

- Eff. ever so slightly increases from devel to track kaboom (17_PU70), mostly at low $p_T$

- All around improved eff. for 18_PU50 (although no seeds $p_T < 0.25$ GeV)

# Eff. vs. η ($p_T$ > 0 GeV)

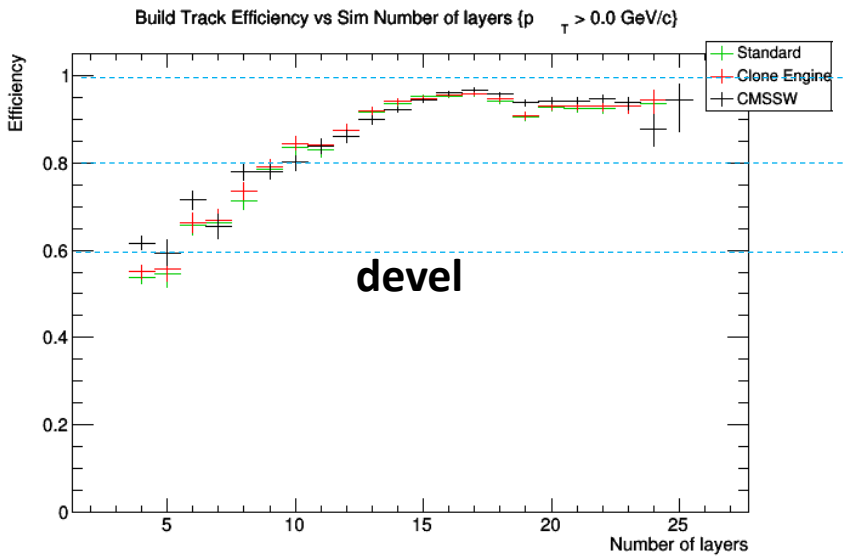


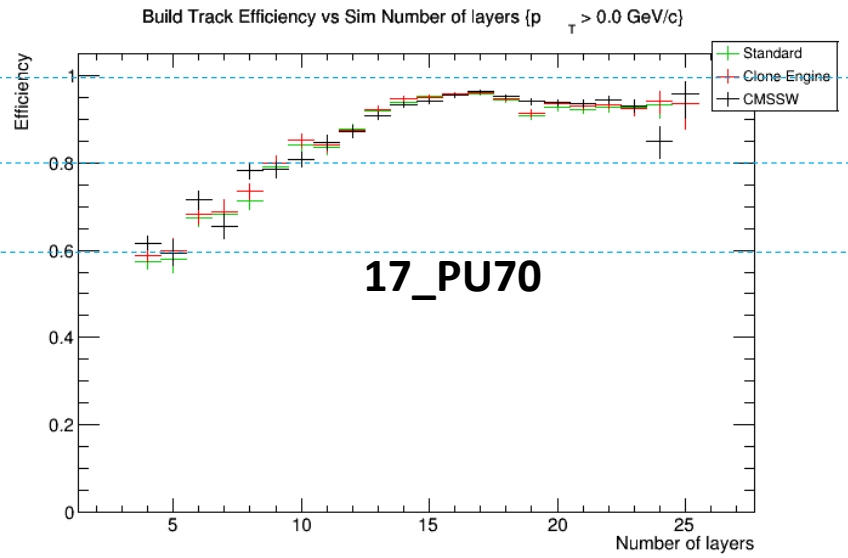



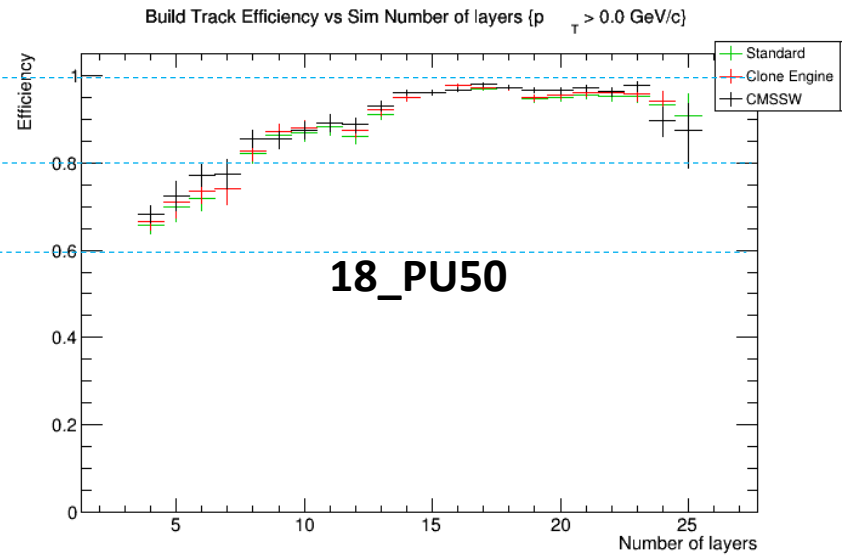




- Eff. ever so slightly increases from devel to track kaboom (17_PU70)
- All around improved eff. for 18_PU50, most noticeably for transition region and endcaps

# Eff. vs. nLayers ($p_T$ > 0 GeV)



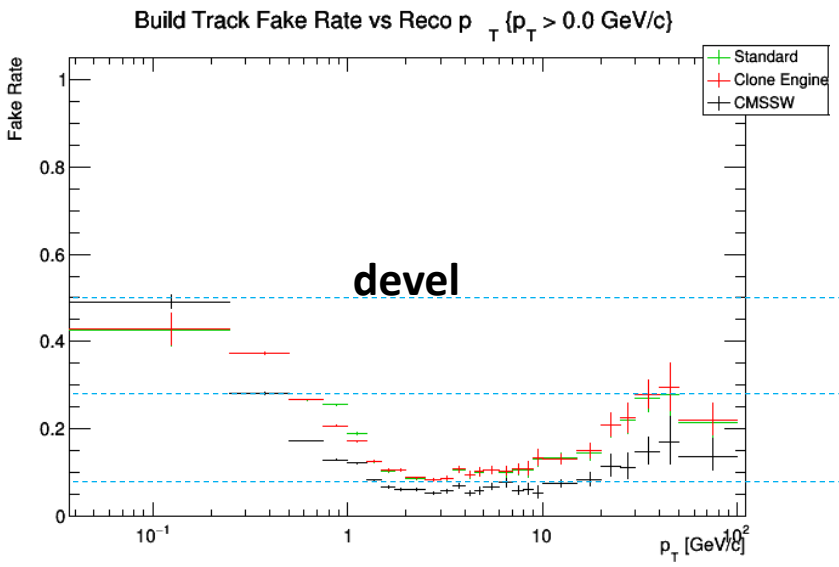



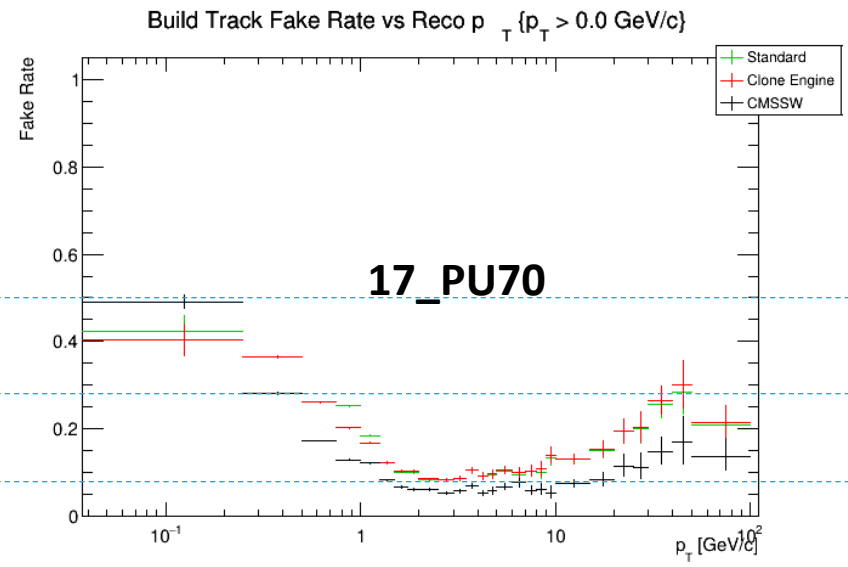



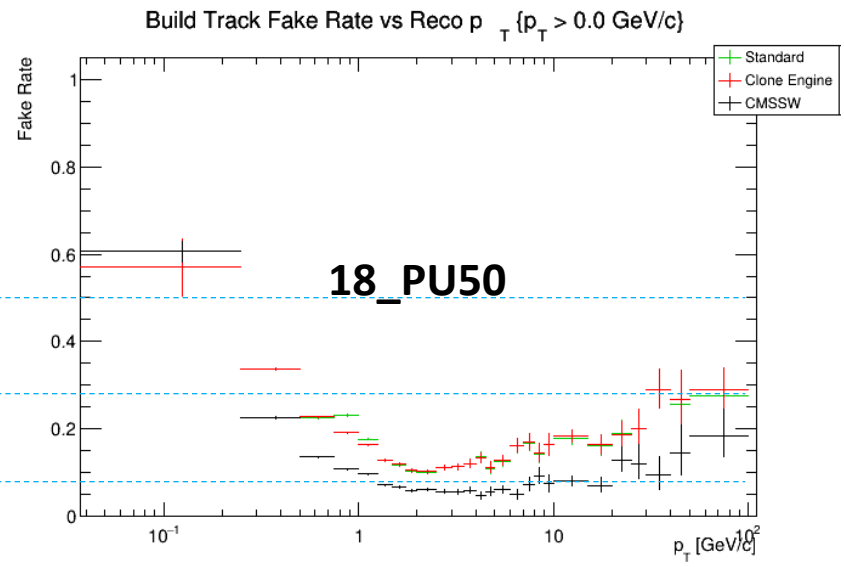

- Eff. increases by 5% or so at low nLayers from devel to track kaboom (17_PU70)

- All around improved eff. for 18_PU50, most noticeably for low nLayers

# FR vs. $p_T$




- FR decreases by 2-5% for $p_T$ < 1 GeV from devel to track kaboom (17_PU70)
- FR increases almost all around (except maybe 0.25 < $p_T$ <1.25) for 18_PU50