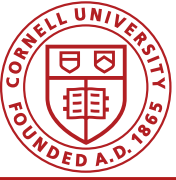


mkFit Standalone Validation Comparison

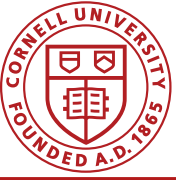
Kevin McDermott



Definitions

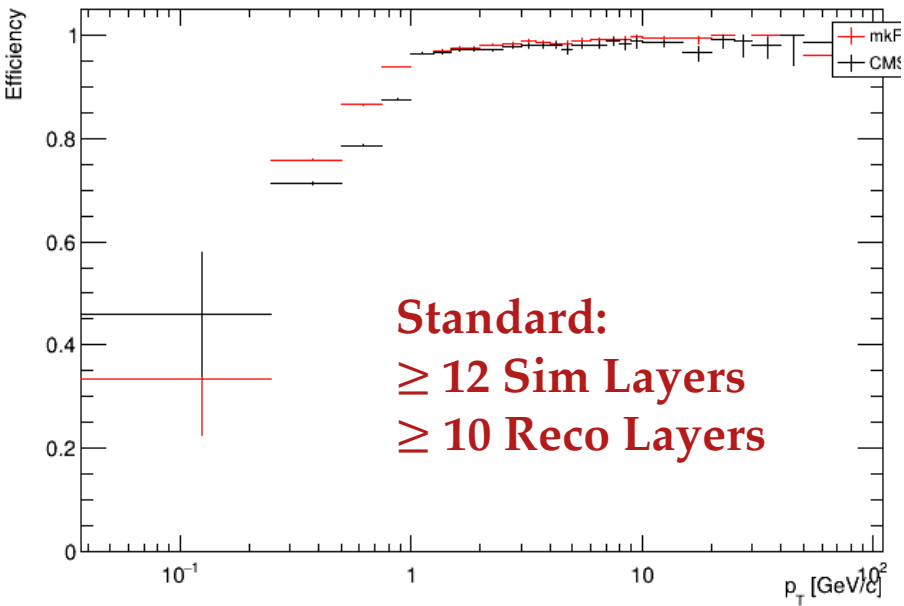


- **Hit Matching Requirements**
 - Standard (**slides 3, 5, 7**):
 - 50% of hits after seed on reco track match hits from a single sim track
 - Modified (**slides 4, 6, 8**):
 - 75% of all hits on reco track match hits from a single sim track
- **nLayers Requirement**
 - Standard (**Left**):
 - ≥ 12 Sim Layers
 - ≥ 10 Reco Layers
 - Modified (**Right**):
 - ≥ 5 Sim Layers
 - ≥ 5 Reco Layers

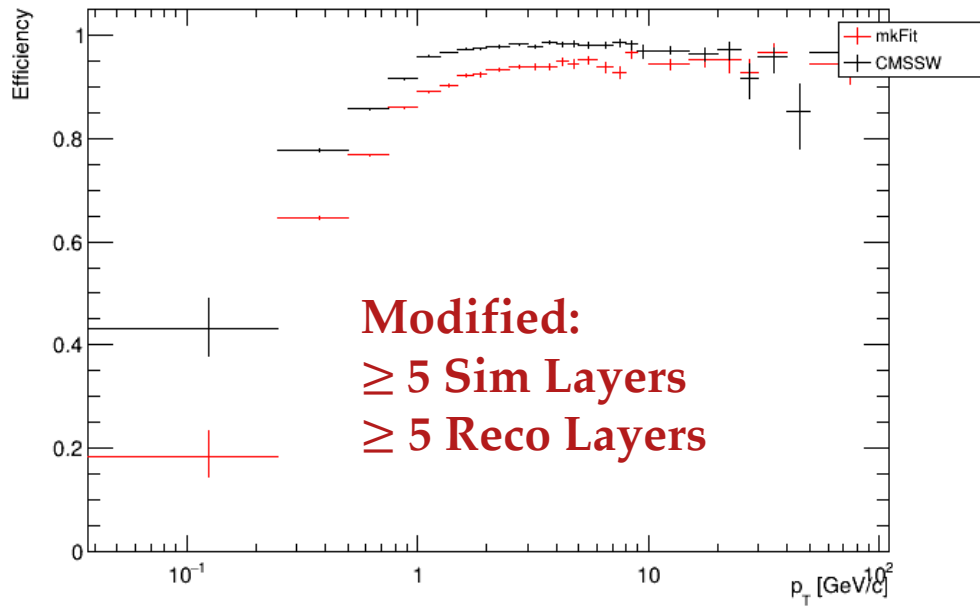


Standard Efficiency vs p_T (50% after seed)

Build Track Efficiency vs Sim p_T ($p_T > 0.0$ GeV/c)

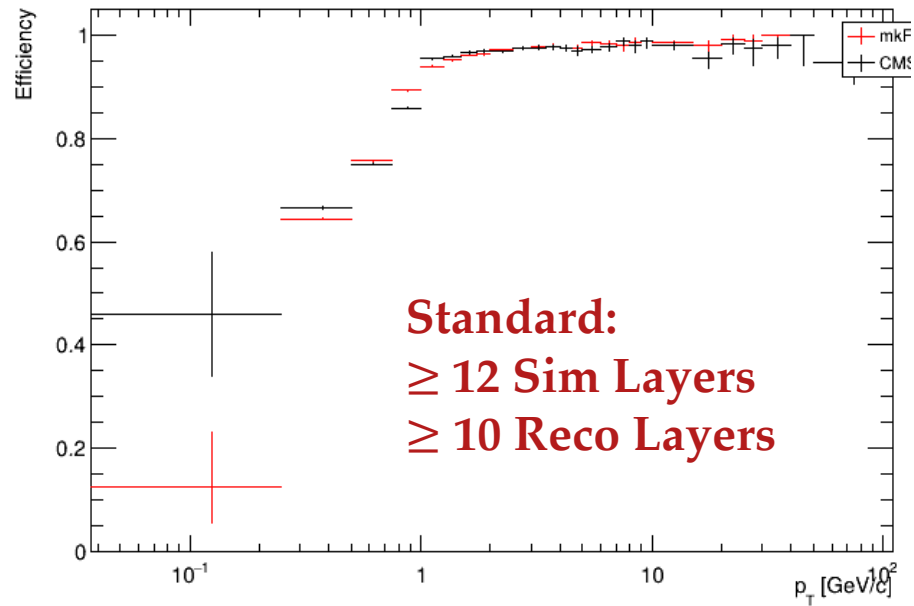


Build Track Efficiency vs Sim p_T ($p_T > 0.0$ GeV/c)

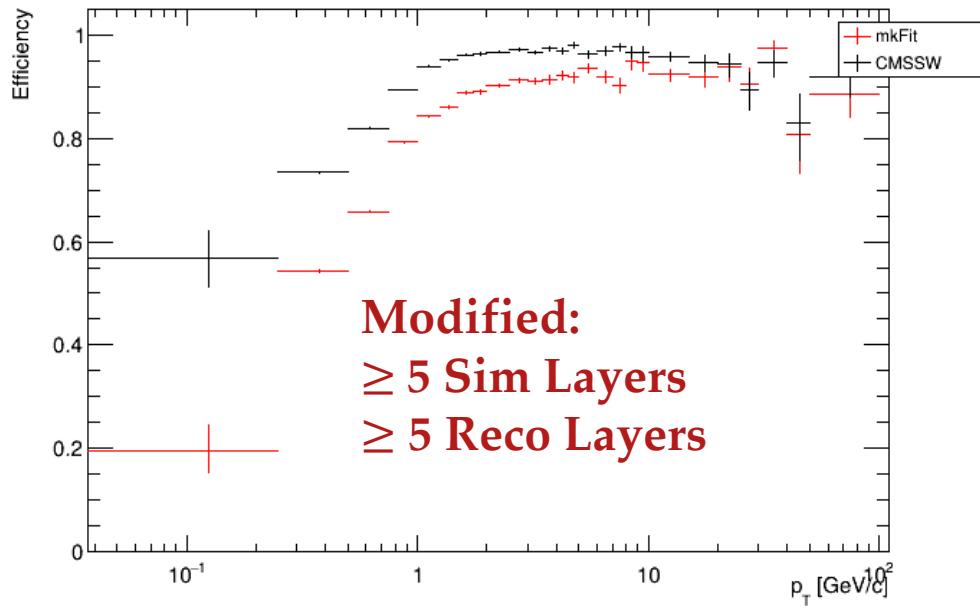


Modified Efficiency vs p_T (75% all hits)

Build Track Efficiency vs Sim p_T { $p_T > 0.0$ GeV/c}

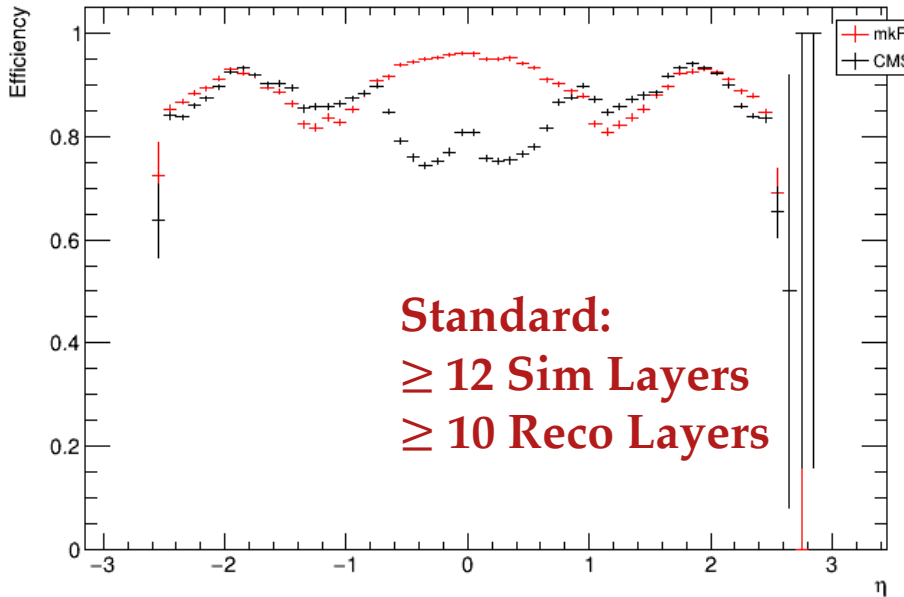


Build Track Efficiency vs Sim p_T { $p_T > 0.0$ GeV/c}

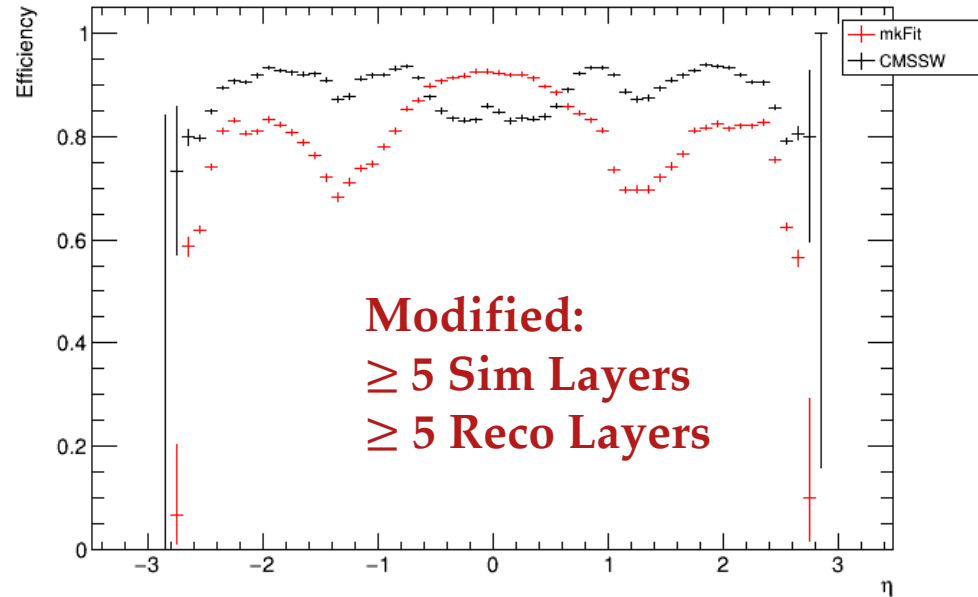


$[p_T > 0.0]$

Build Track Efficiency vs Sim η ($p_T > 0.0$ GeV/c)



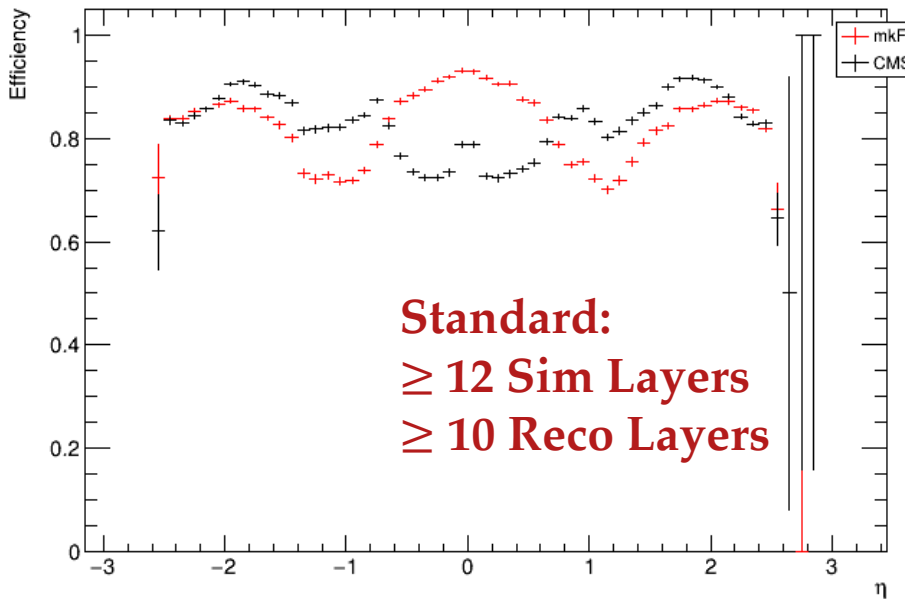
Build Track Efficiency vs Sim η ($p_T > 0.0$ GeV/c)



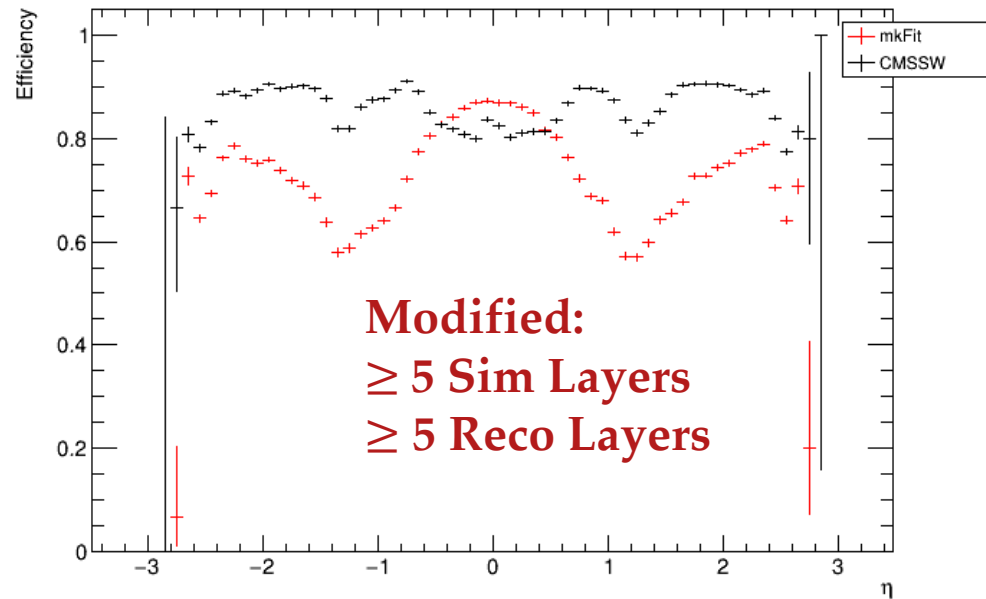
Modified Efficiency vs η (75% all hits)

$$[p_T > 0.0]$$

Build Track Efficiency vs Sim η ($p_T > 0.0$ GeV/c)

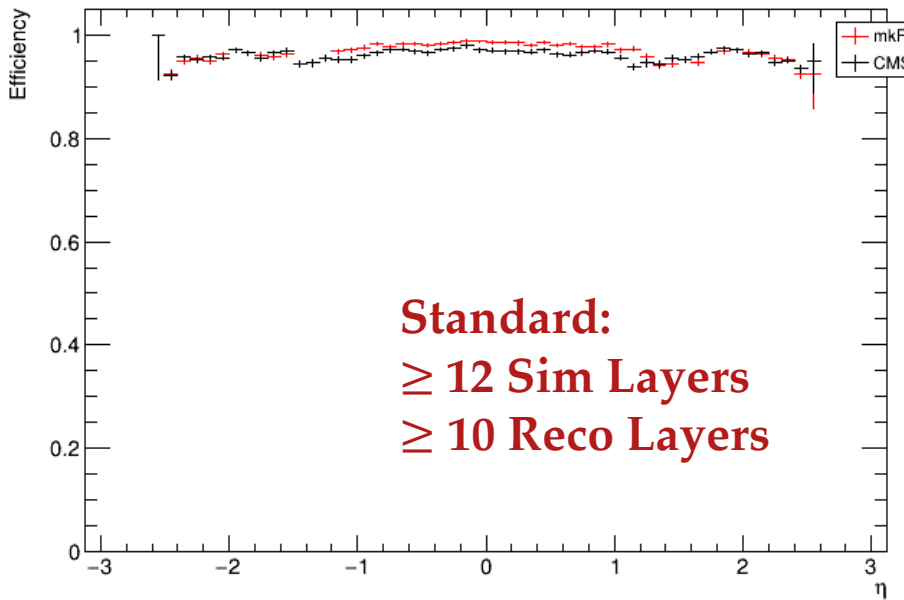


Build Track Efficiency vs Sim η ($p_T > 0.0$ GeV/c)

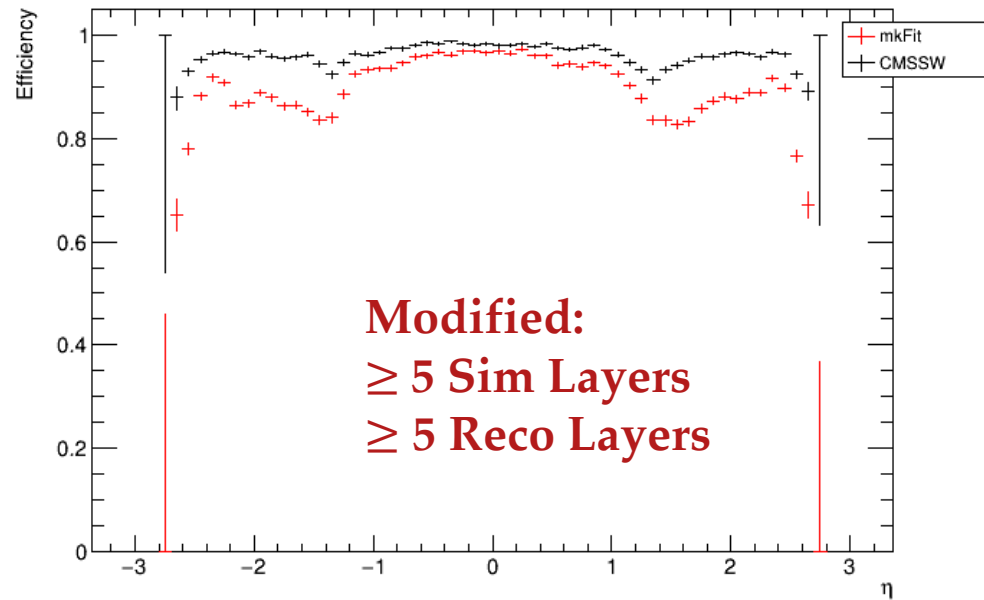


$[p_T > 0.9]$

Build Track Efficiency vs Sim η $\{p_T > 0.9 \text{ GeV/c}\}$



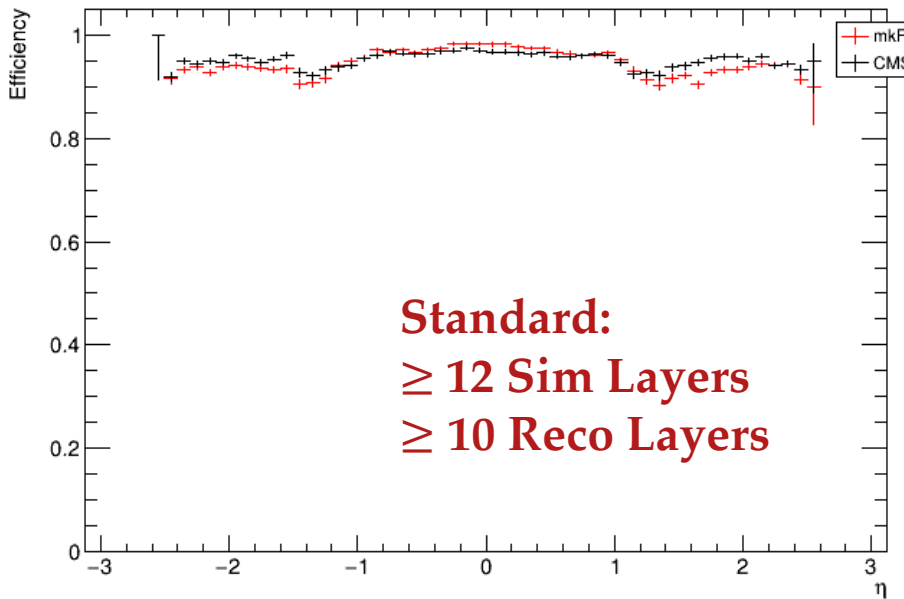
Build Track Efficiency vs Sim η $\{p_T > 0.9 \text{ GeV/c}\}$



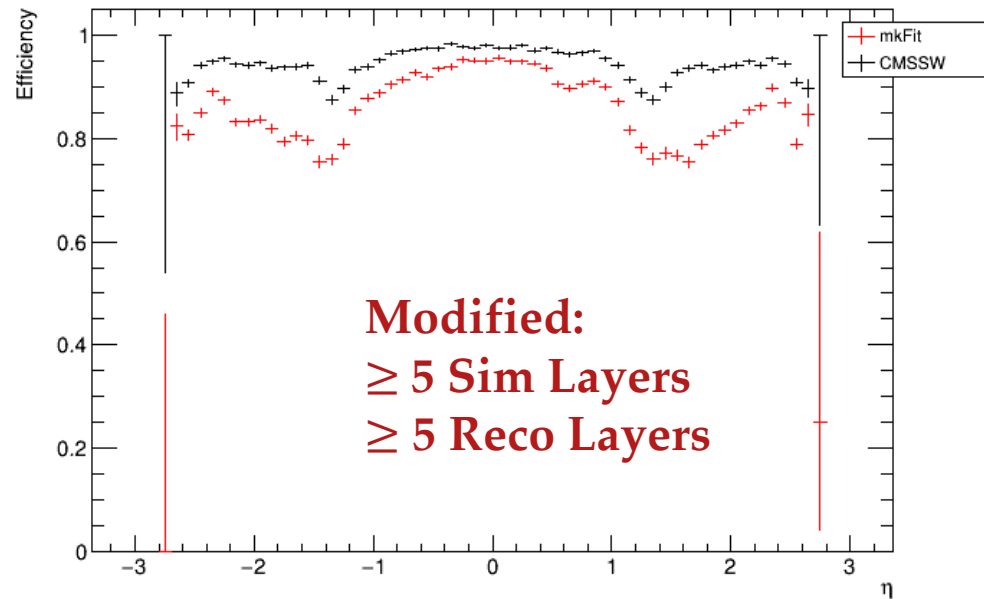
Modified Efficiency vs η (75% all hits)

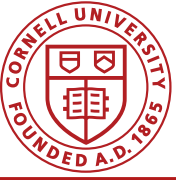
$[p_T > 0.9]$

Build Track Efficiency vs Sim η $\{p_T > 0.9 \text{ GeV/c}\}$



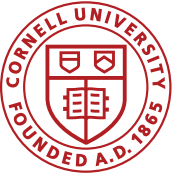
Build Track Efficiency vs Sim η $\{p_T > 0.9 \text{ GeV/c}\}$





Observations

- While the lower layer requirements hurts CMSSW a bit, definitely hurts mkFit across full p_T spectrum
- The higher layer requirement helps us to outperform CMSSW at low p_T , particularly in the barrel
- In addition, moving to 75% matching criteria, we really start to lose at low p_T although it also affects us at high p_T
- With both the lower layer requirement and the 75% hit matching, the difference between CMSSW and mkFit is closer to MTV (even if the absolute numbers are a bit off)



Backup