Update
Study on the quadratic term
in the CT fit for low-pT tracks
## (Extension only)

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Introduction

- **ILCSoft version used: (updated!)** Release 2019_09_04

- **Cell Extension - concept:**

- Find high-pT tracks with linear CT fit, marked hits as used, and <u>search for low-Pt ones</u> with all unused hits, provided that they are not located on the other side of the detector in z + quadratic term introduced in the regression formula

- **Current $p_{T,cut}$** = 10 GeV (in step 2) and 1 GeV (in step 4)

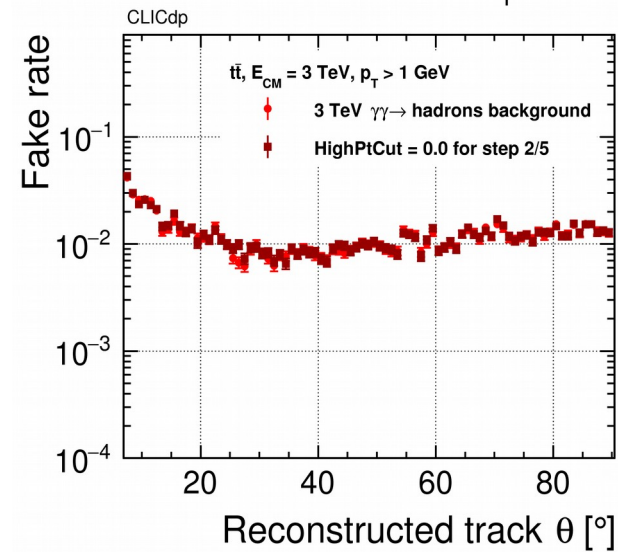- The conformal mapping should work for the low-PT tracks → the linear CT fit should work!
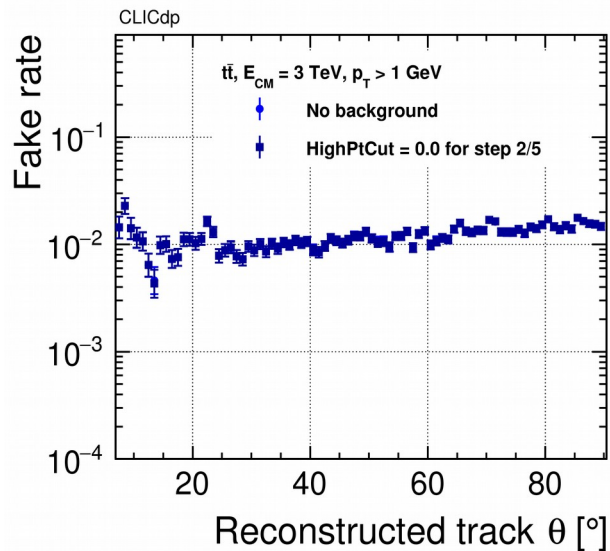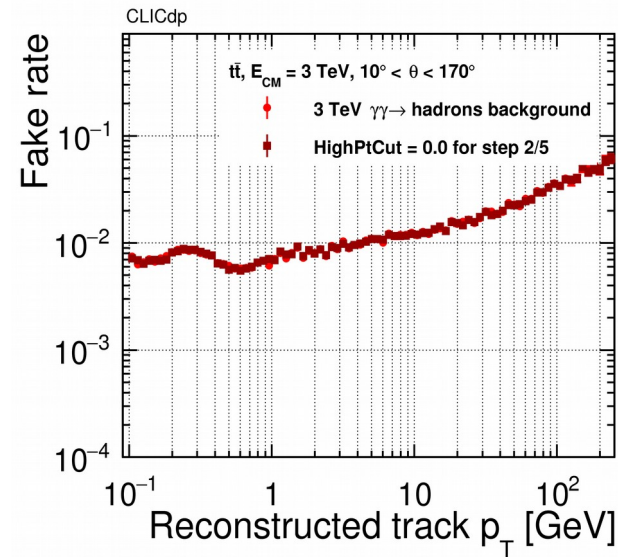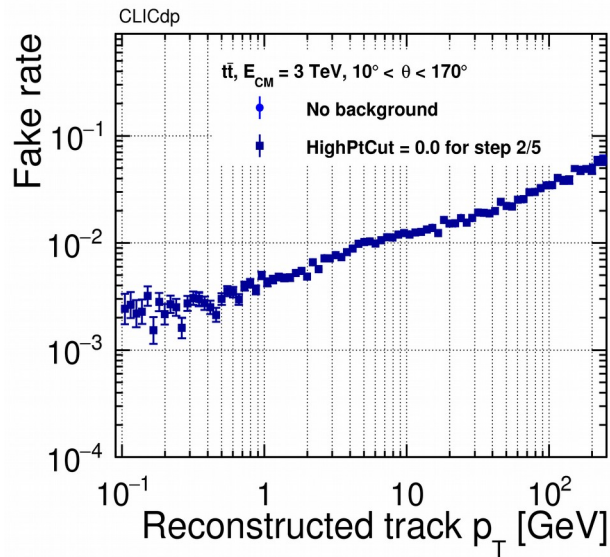
Efficiency
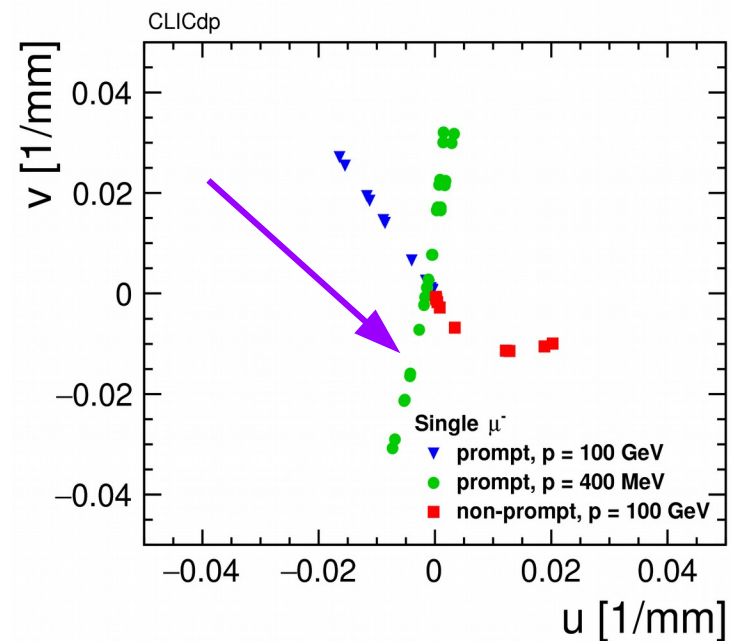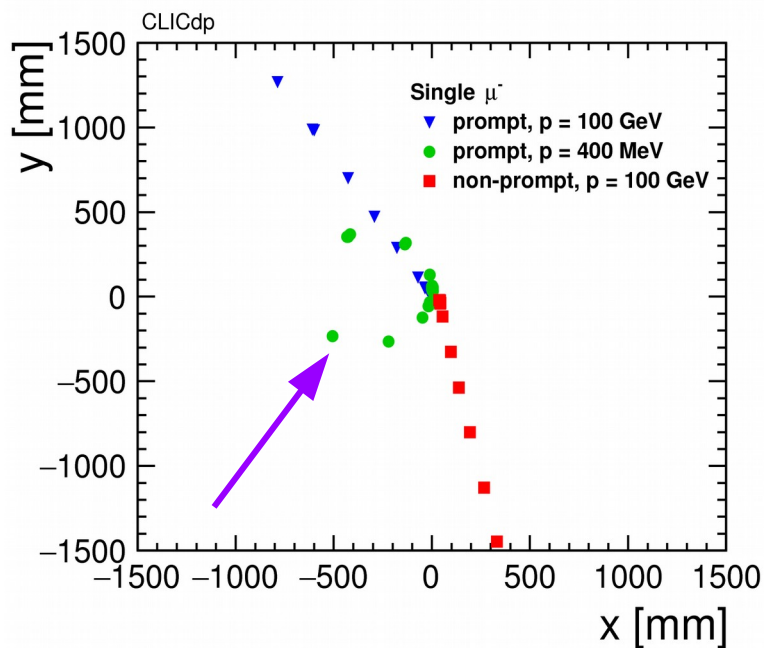
- **Complex events: ttbar,** nHits >= 3

- **ProdId = 14321, 14232**
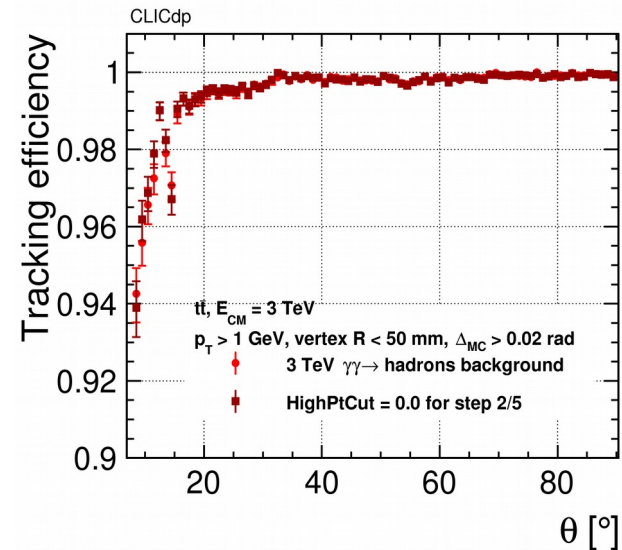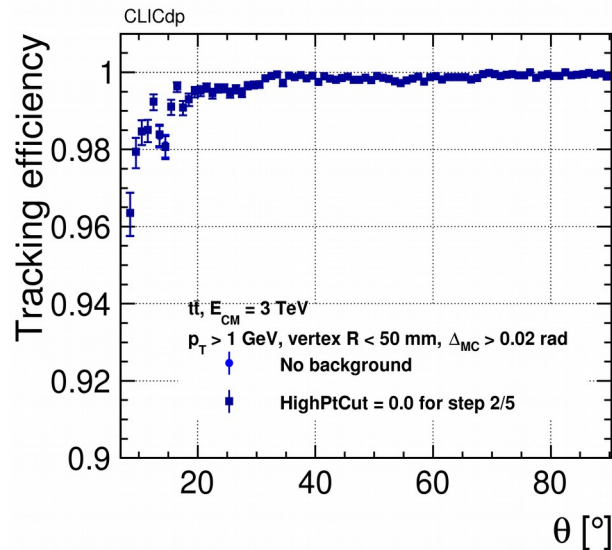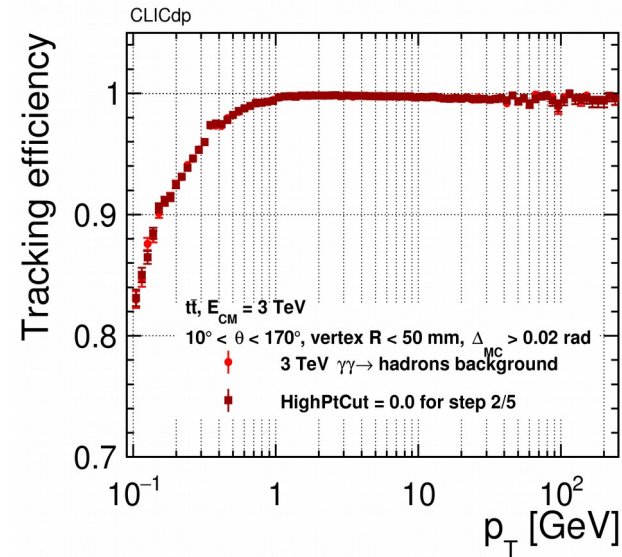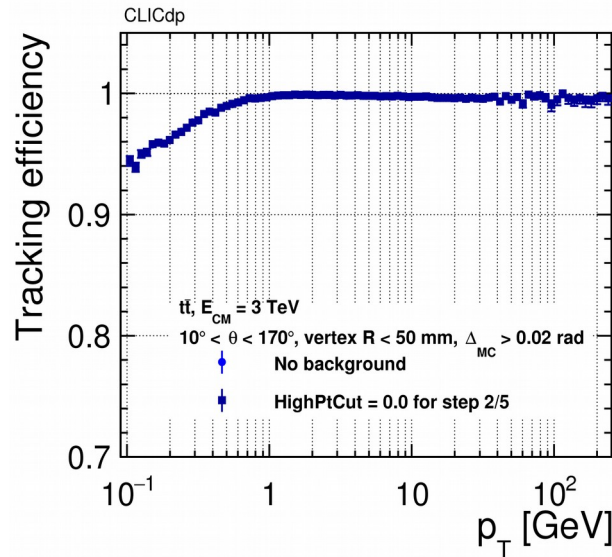
- **25k events**

Fake rate

- **Complex events: ttbar,** nHits >= 4

- **ProdId = 14321, 14232**

- **25k events**

Timing

- **Complex events: ttbar**

- **Only 25 events**

	Vanilla (s)	HighPtCut = 0 (s)
ttbar	631.76	632.21
ttbar + overlay	9576.81	8302.30

- Similar performance w/o overlay

- Reduce CPU time for ttbar w/overlay of 50 sec per ev on average (13%)

  (383 sec → 332 s)

(My) Conclusions:

- The quadratic term in the fit is not needed for the low-pT tracks

Thank you for the attention!

- **Single particle: muons,** nHits >= 3