



Tracking and Flavour Tagging

- status and plans -

Erica Brondolin, Emilia Leogrande, Andre Sailer

CLICdp Detector Optimization and Validation Meeting
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Content of the talk



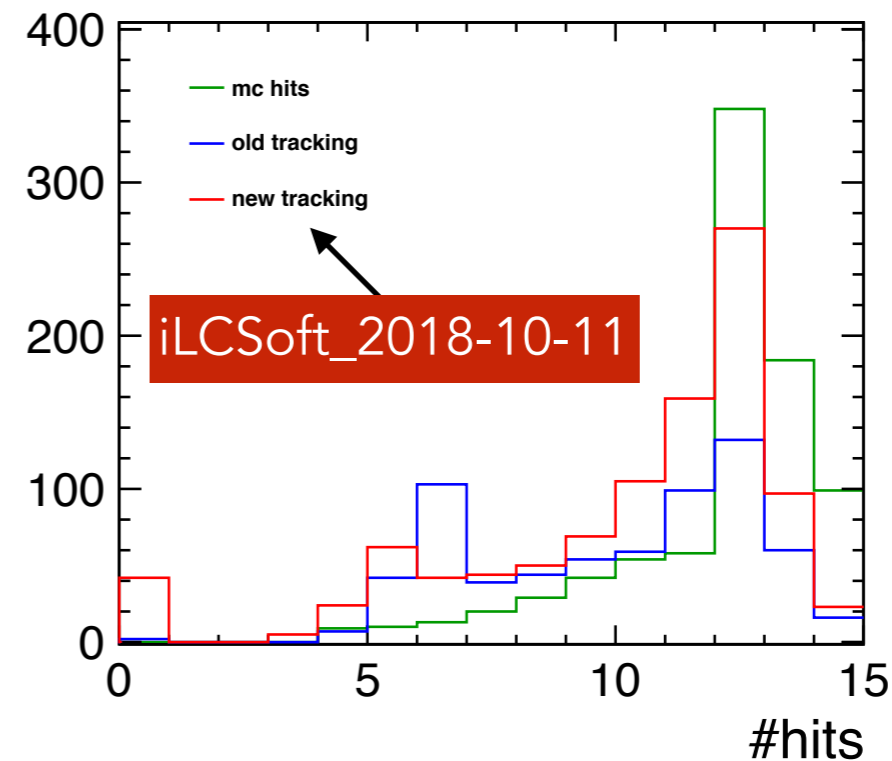
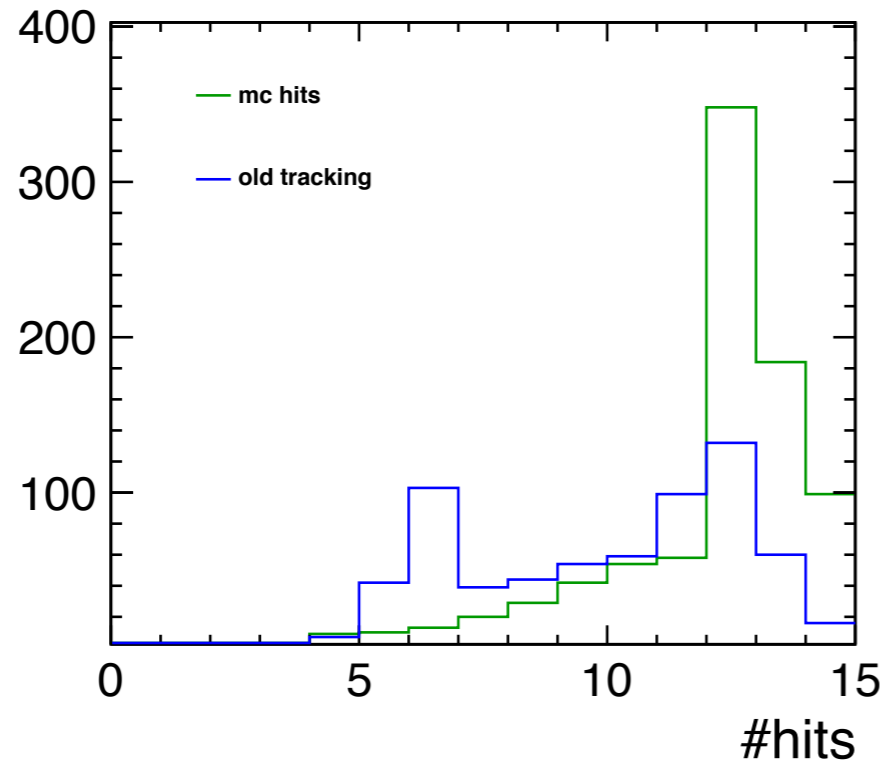
- Conformal Tracking
 - algorithm: news in the pattern recognition
 - performances
 - next steps
- Flavour Tagging
 - performances
 - next steps



iLCSoft releases

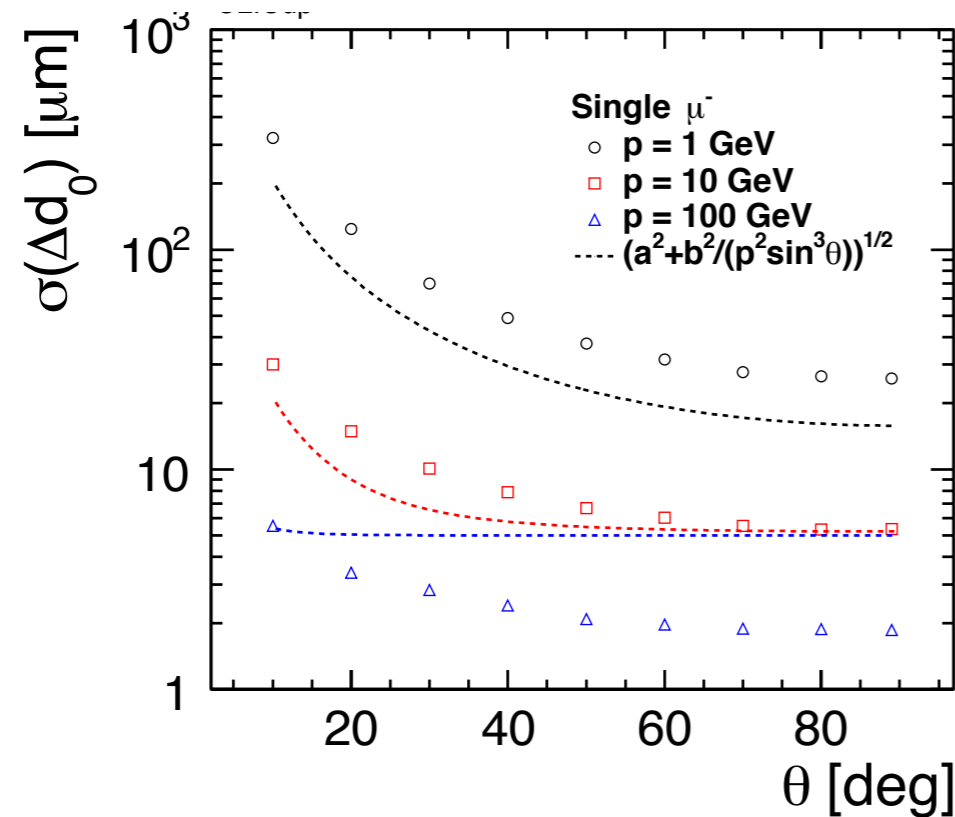
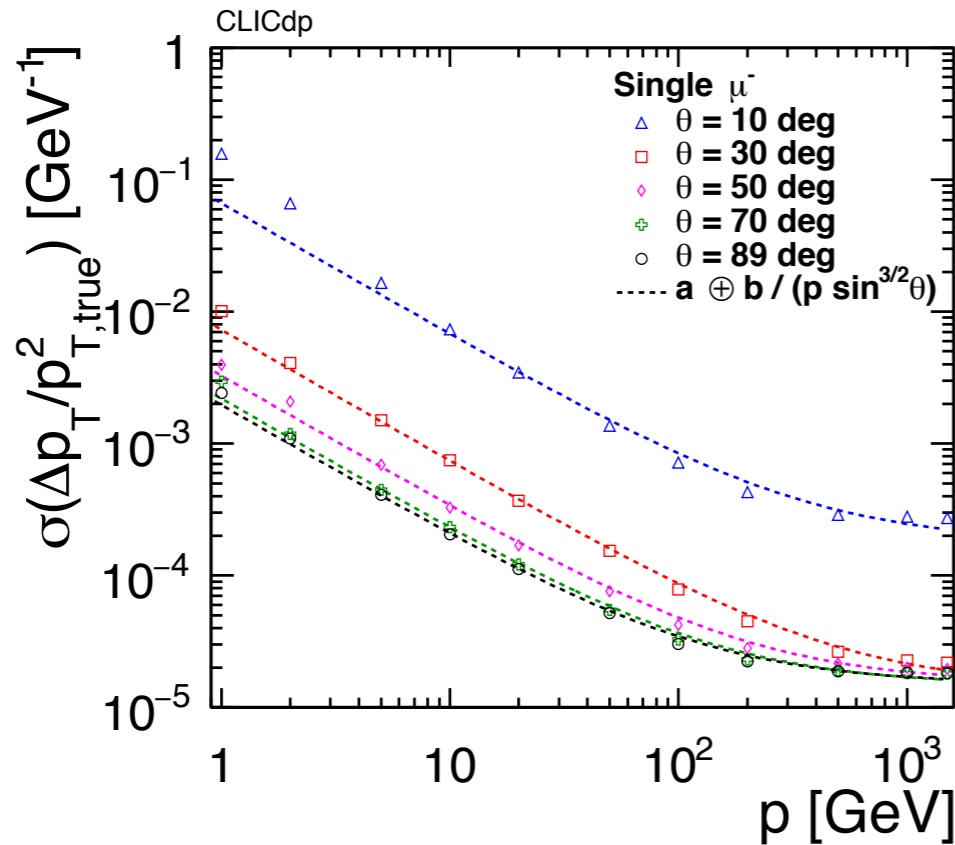


- Latest iLCSoft releases to cope with progresses and tests in tracking and flavour tagging
 - **iLCSoft_2018-10-11** —> main release for plots in detector performance note and other official documents
 - **iLCSoft_2018-10-26** —> unsuccessful tracking test
 - **iLCSoft_2018-11-01** —> new release for tracking tests (more details later in this talk)

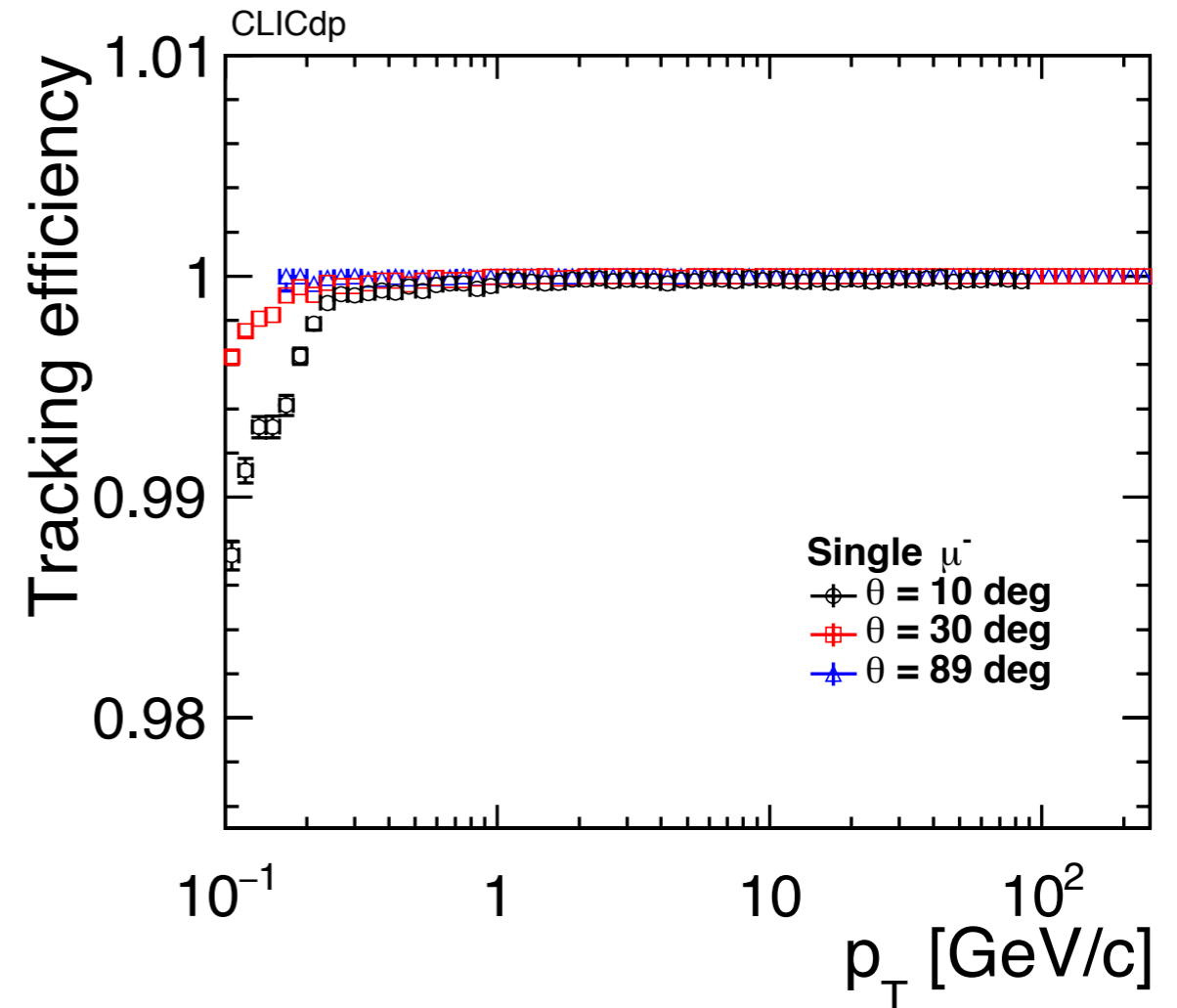


□ New *extend* function

- used to extend tracks created in the vertex detector (seeding) through the tracker (inner+outer)
- extension performed layer by layer
 - cellular automaton to find best cluster per each layer
 - avoids split tracks => reduces multiple tracks per particle

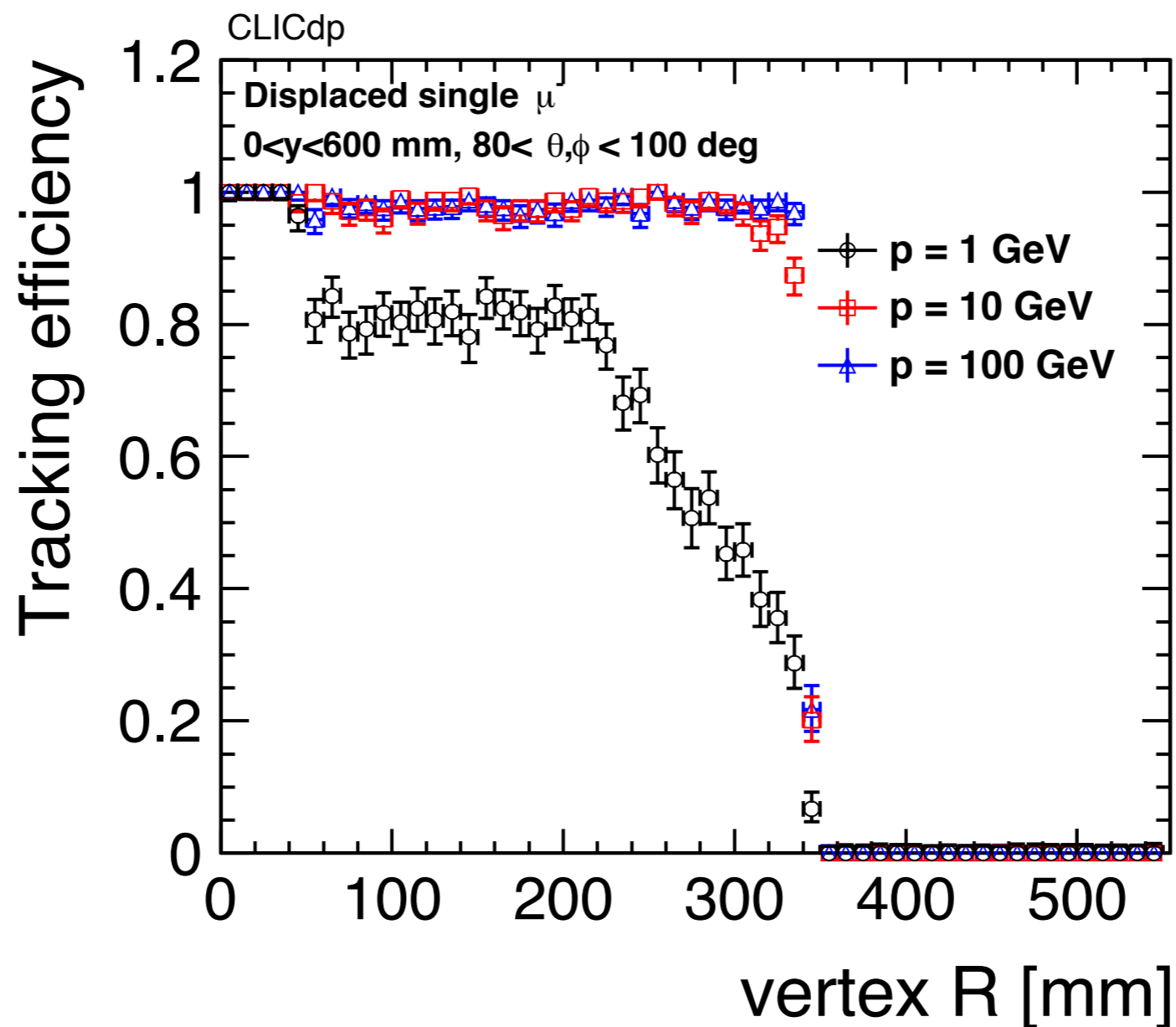


- single particles - prompt
 - resolutions ($p_T, d_0, z_0, \theta, \varphi$)
 - tracking efficiency

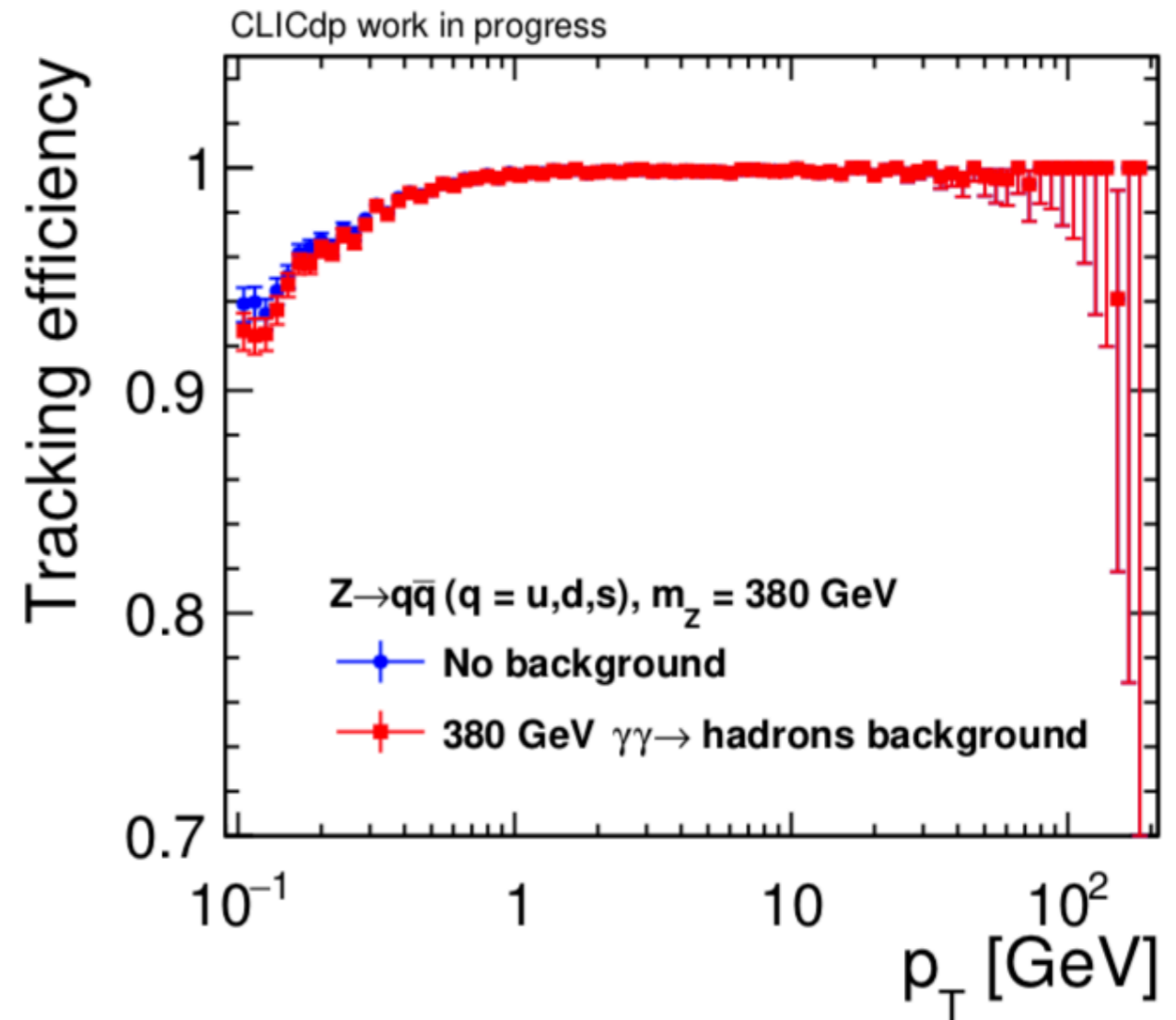
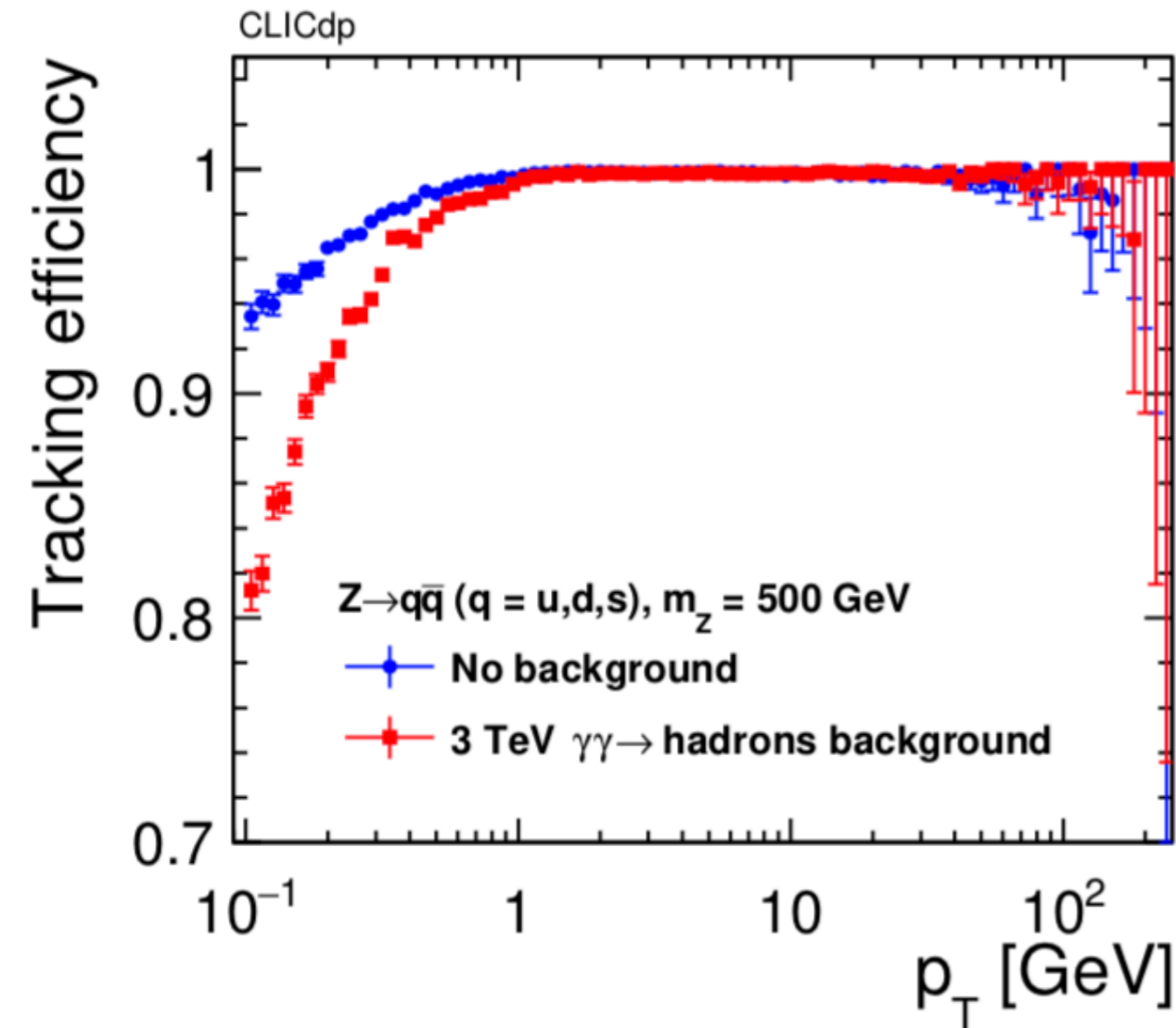


Tracking / performances (II)

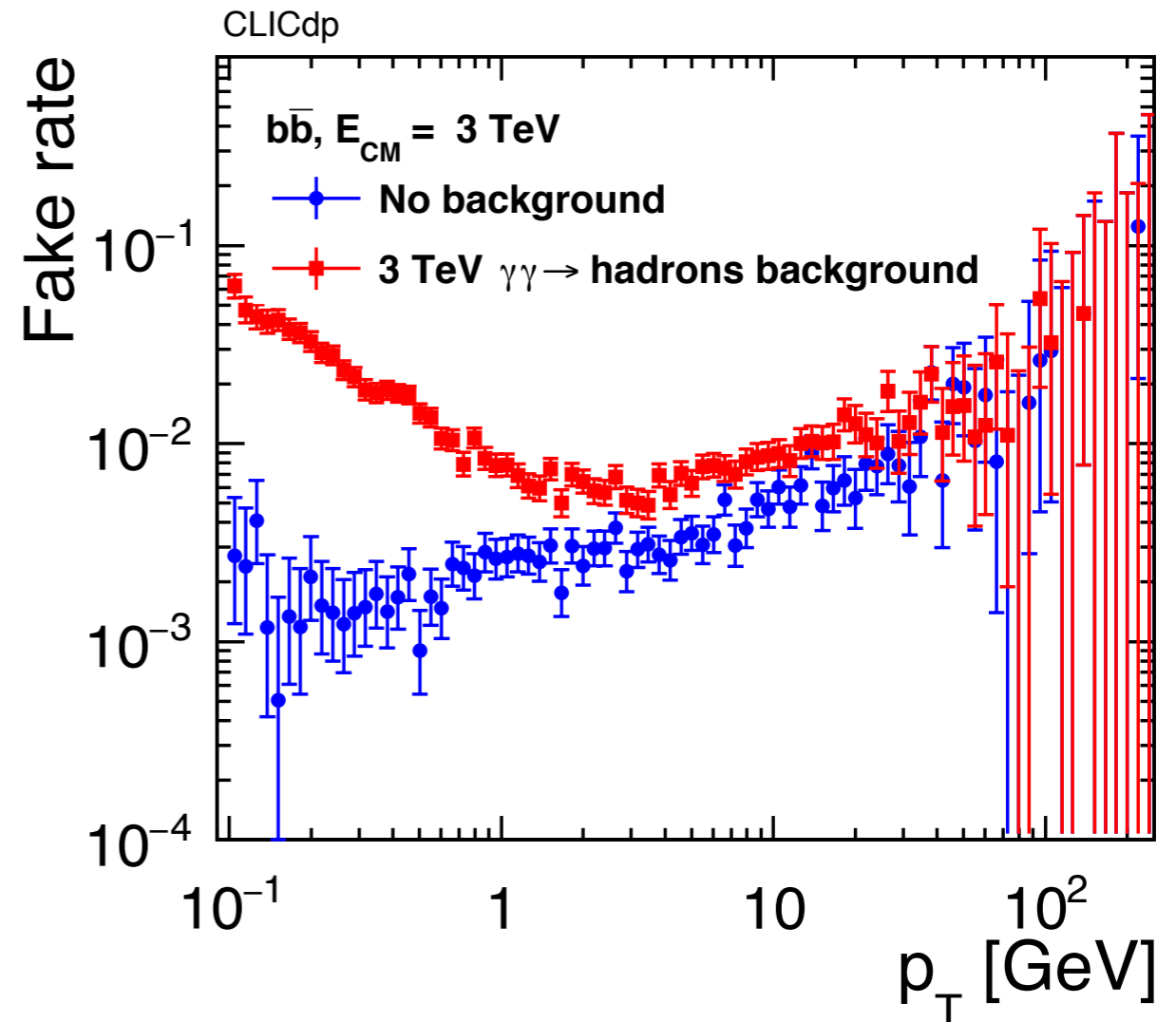
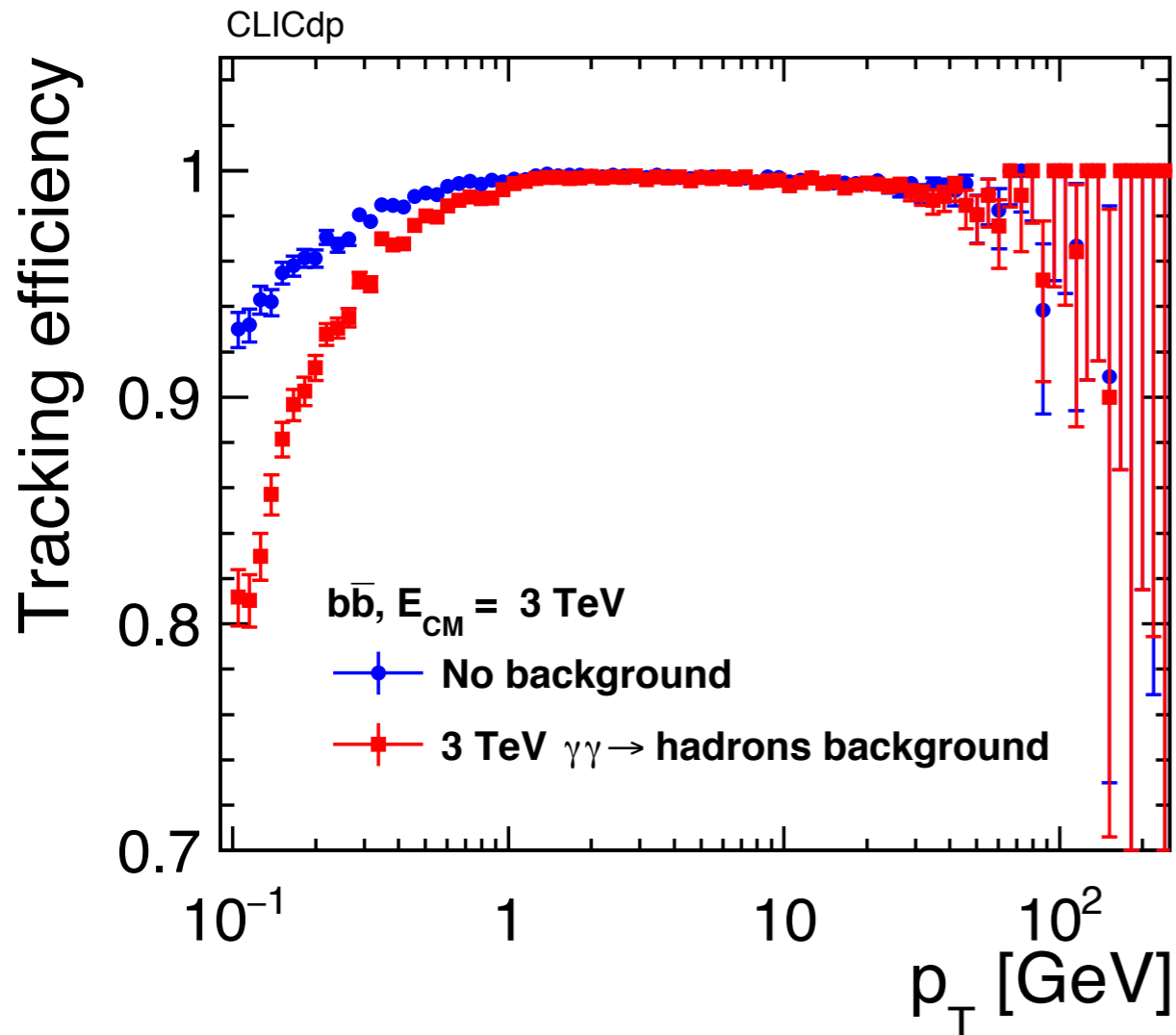
- single particles - displaced

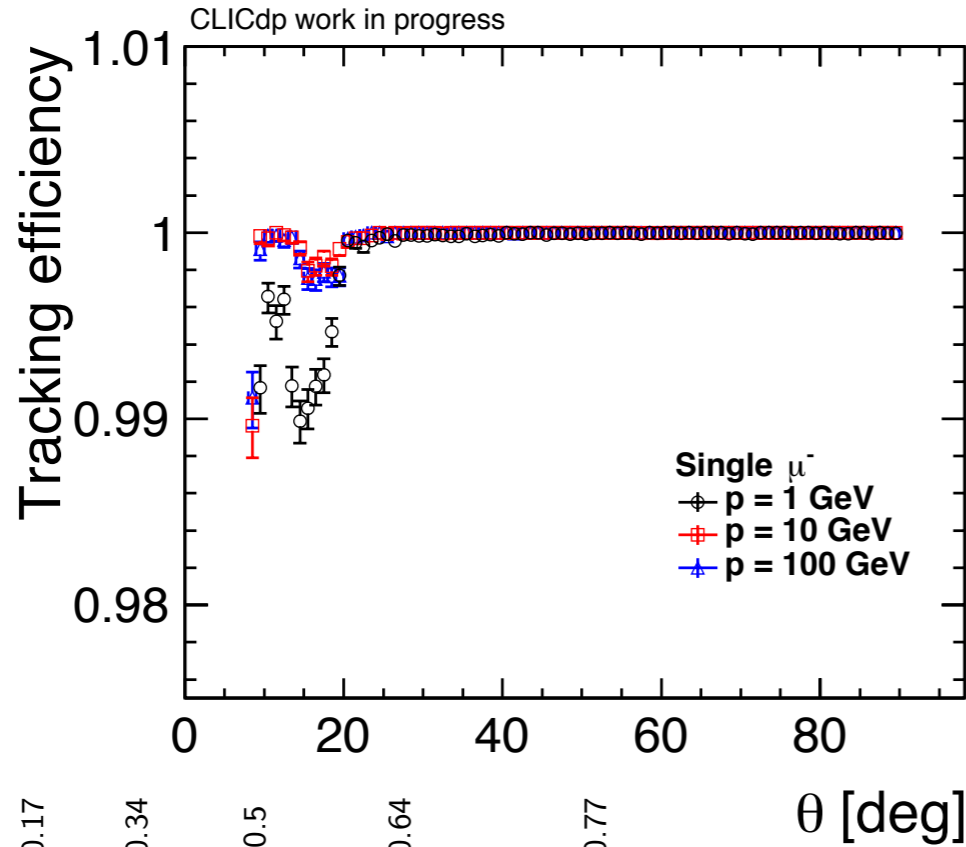


- complex events - tracking efficiencies and fake rate
 - bb, tt, Z->uds events
 - 380 GeV vs 3 TeV background

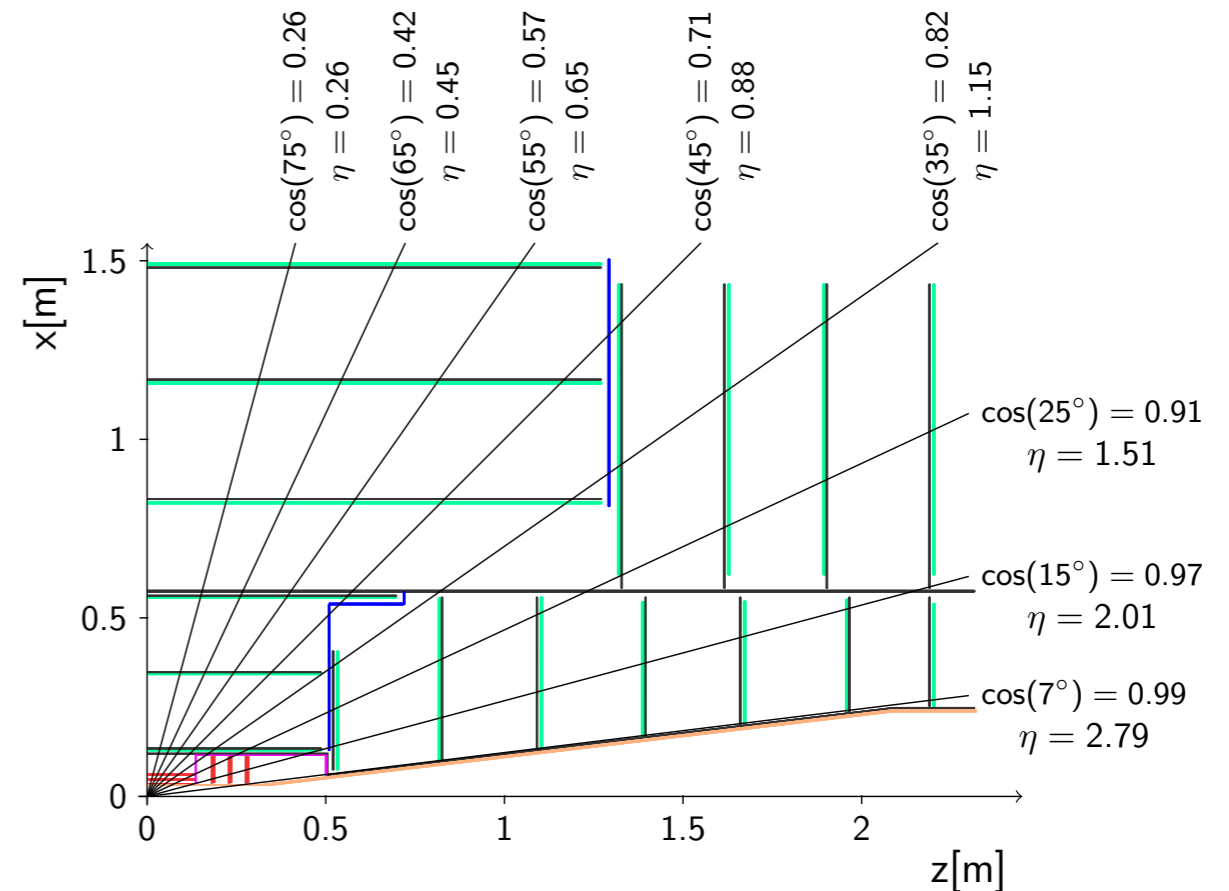
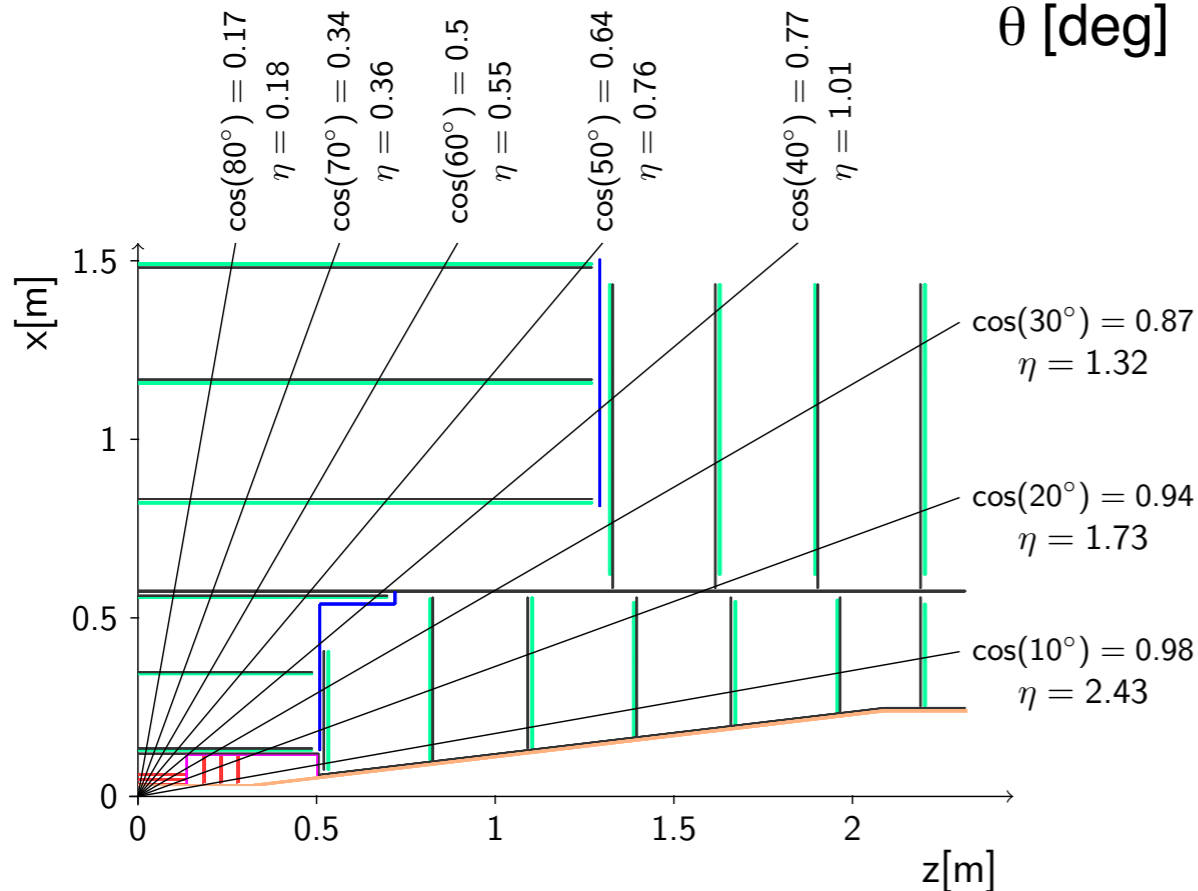


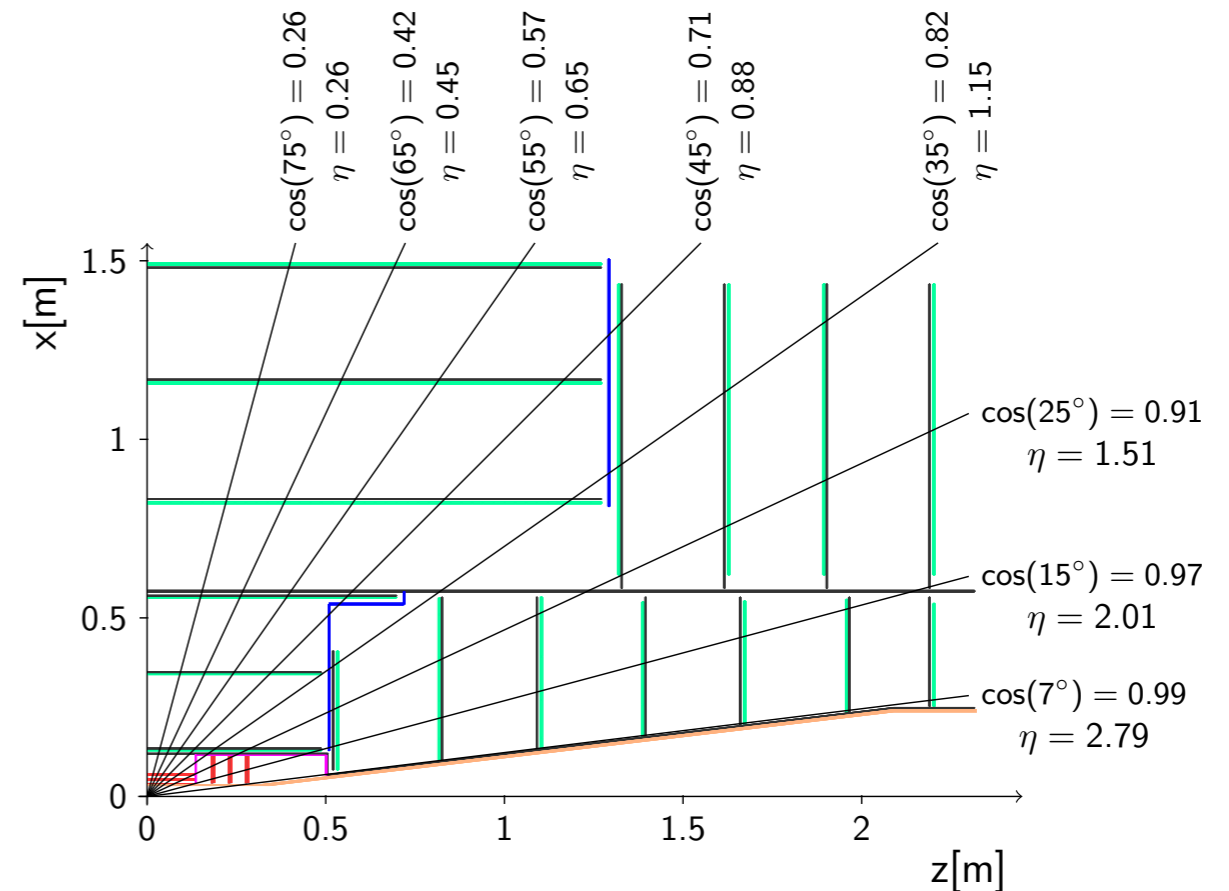
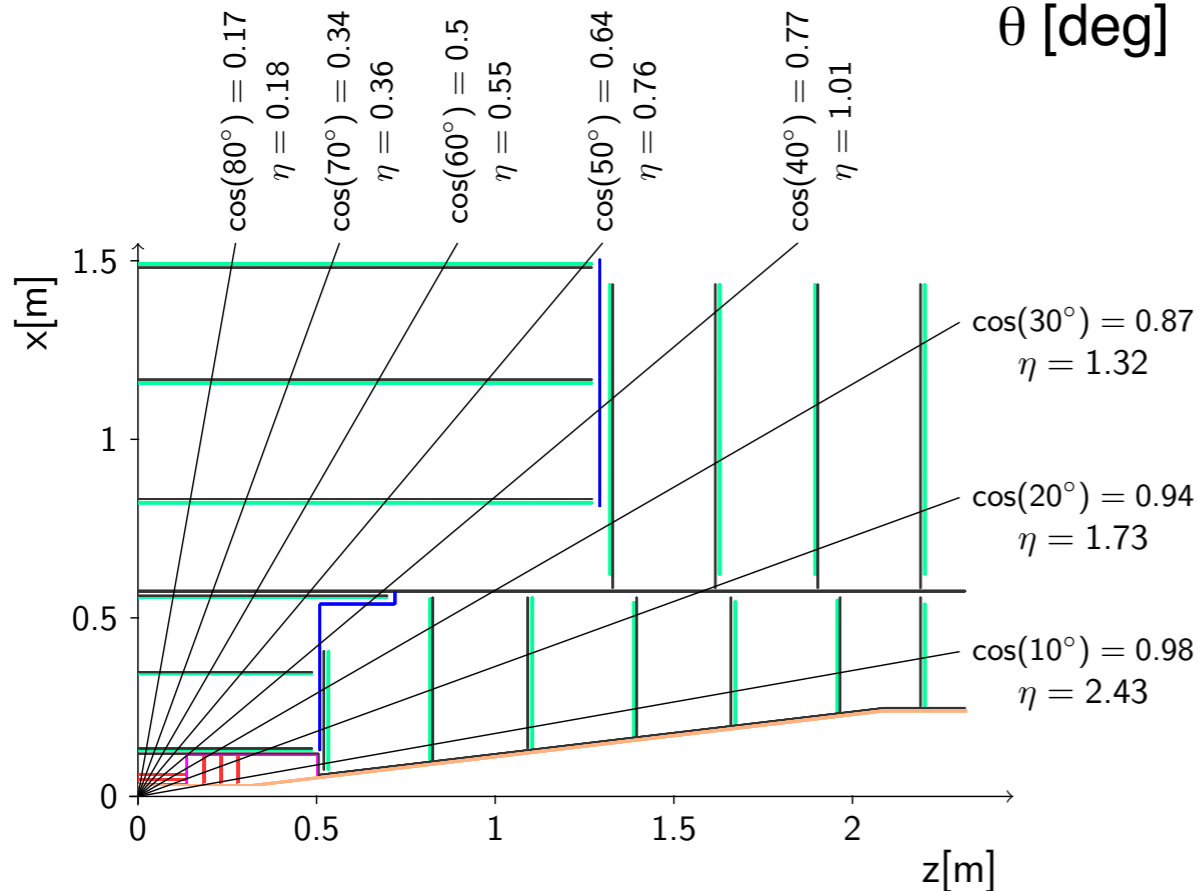
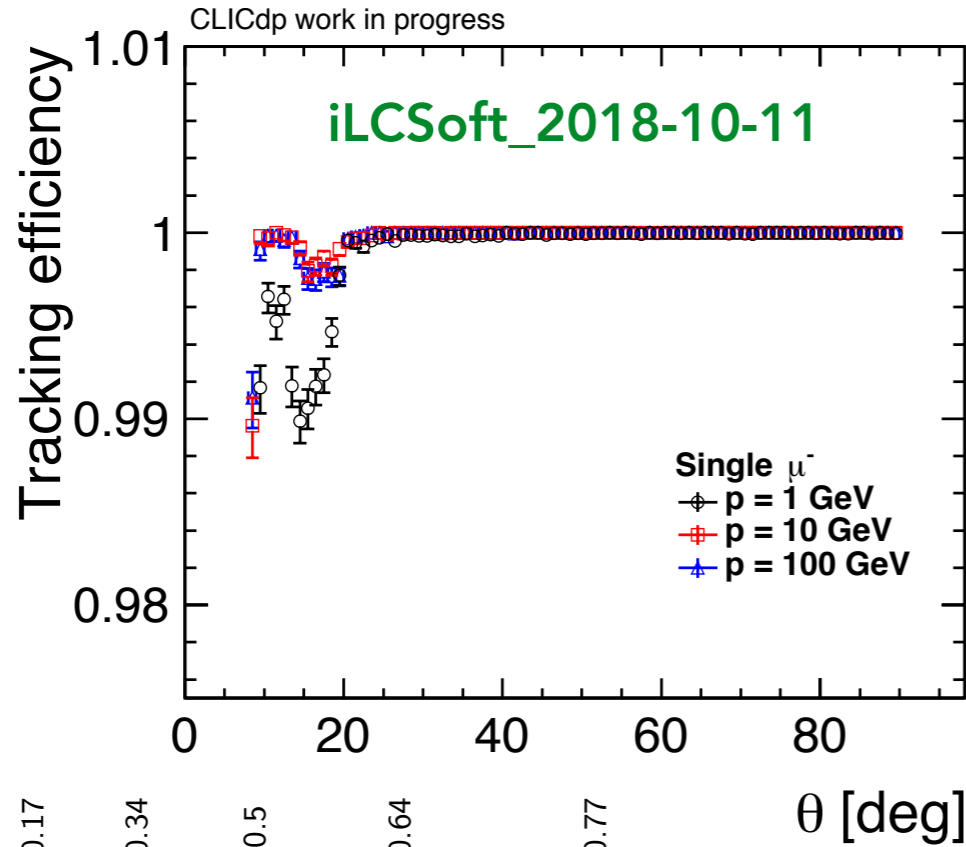
- complex events - tracking efficiencies and fake rate
 - bb , tt , $Z \rightarrow uds$ events
 - 380 GeV vs 3 TeV background

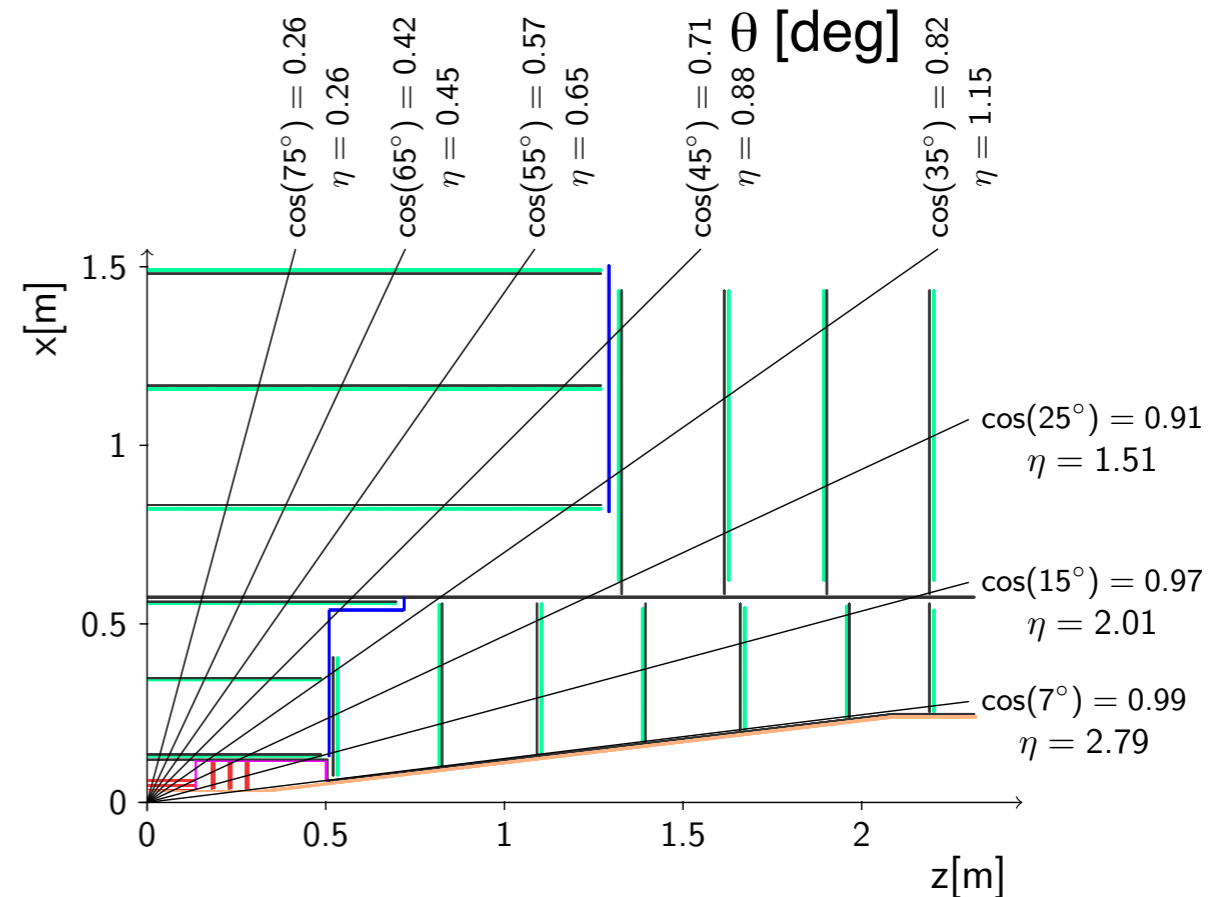
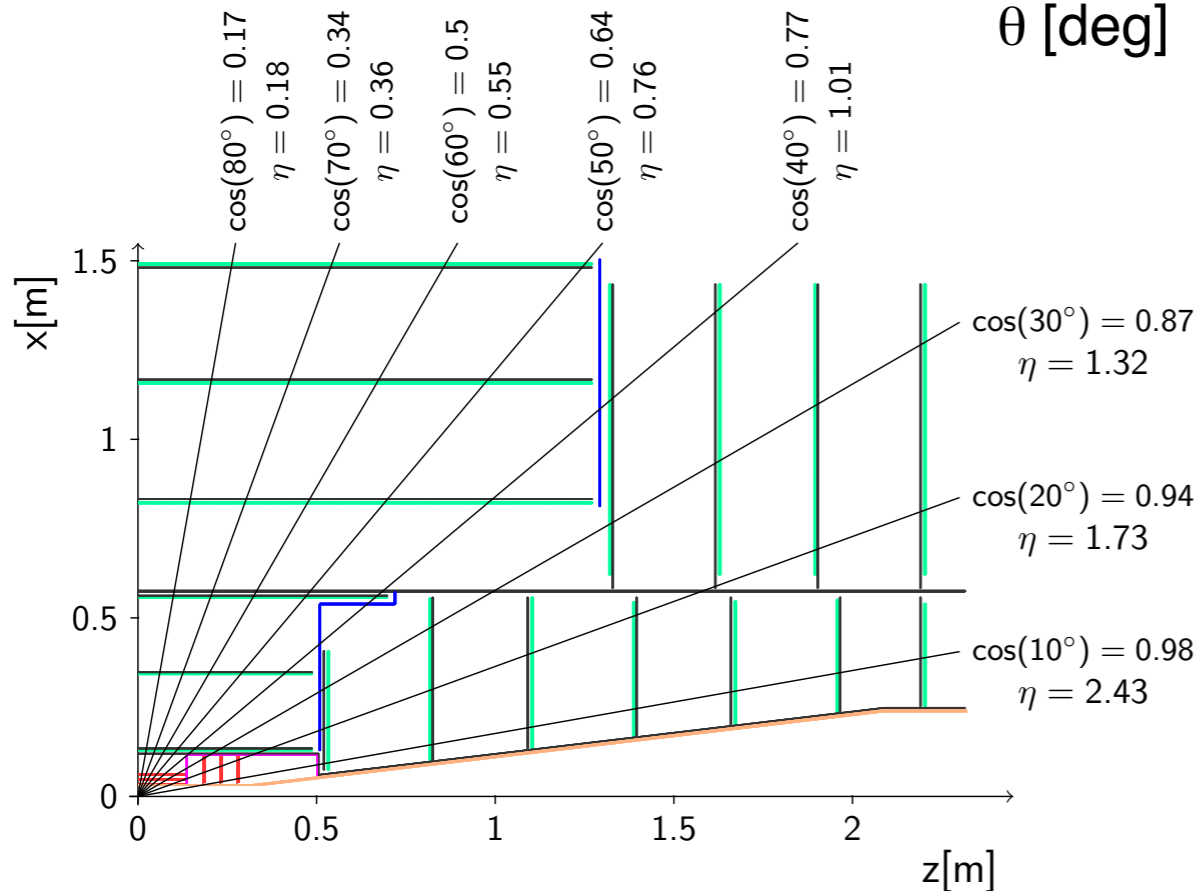
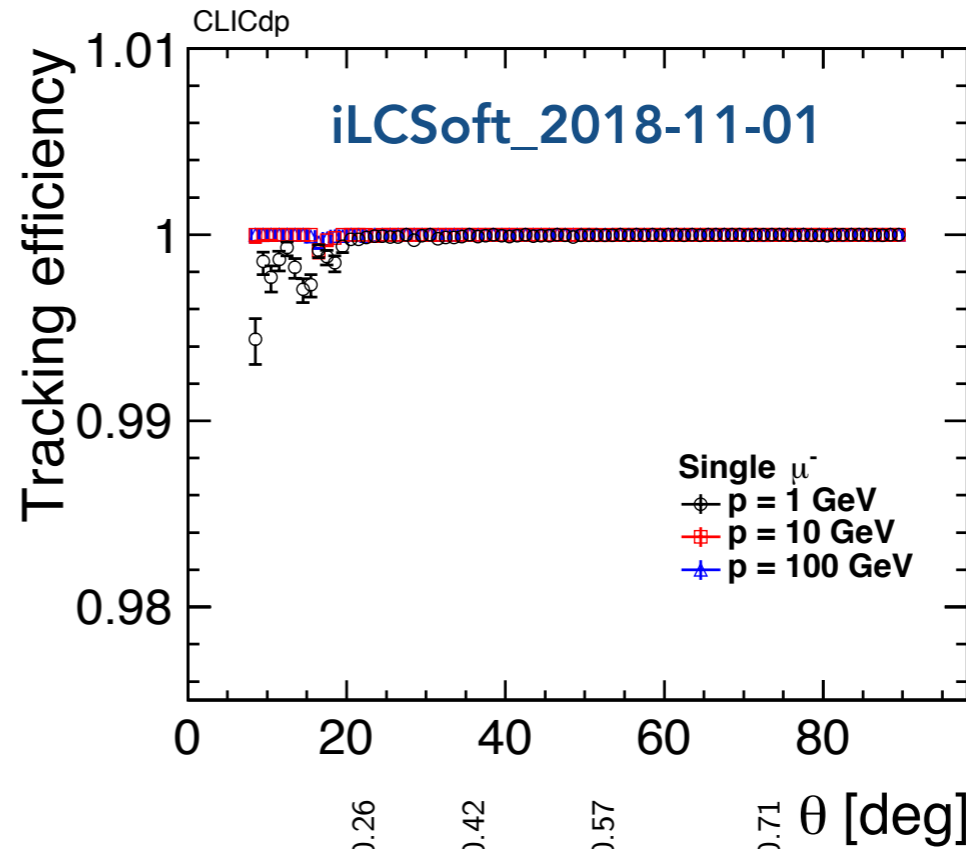
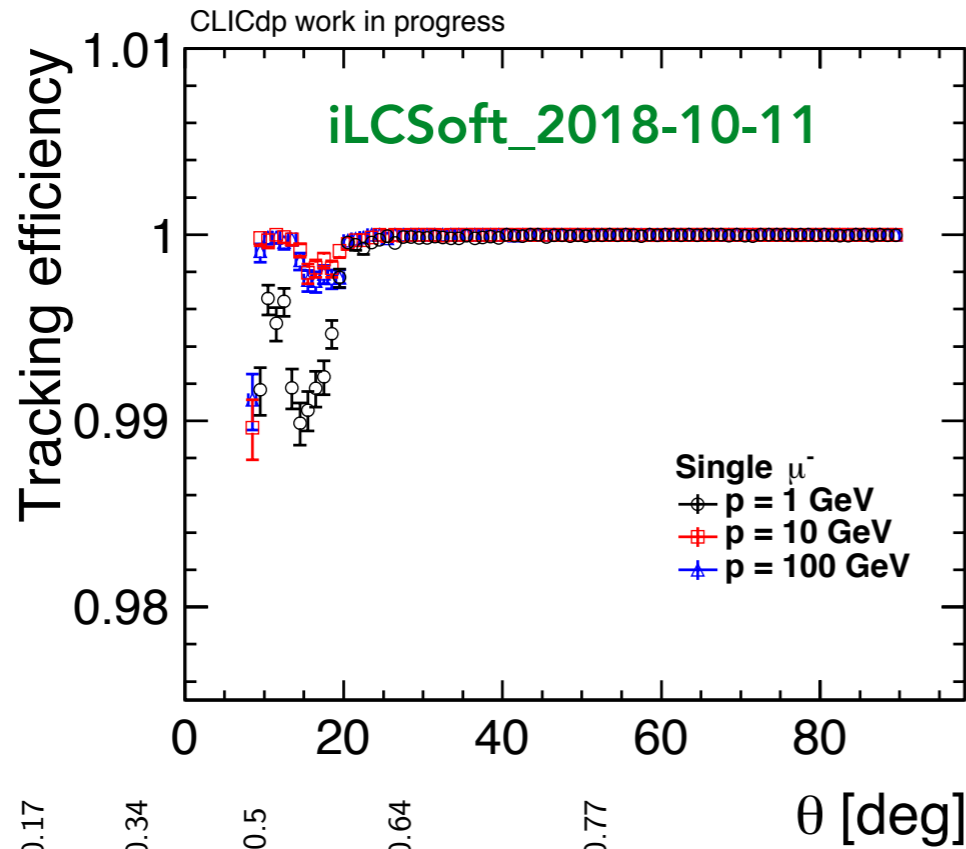




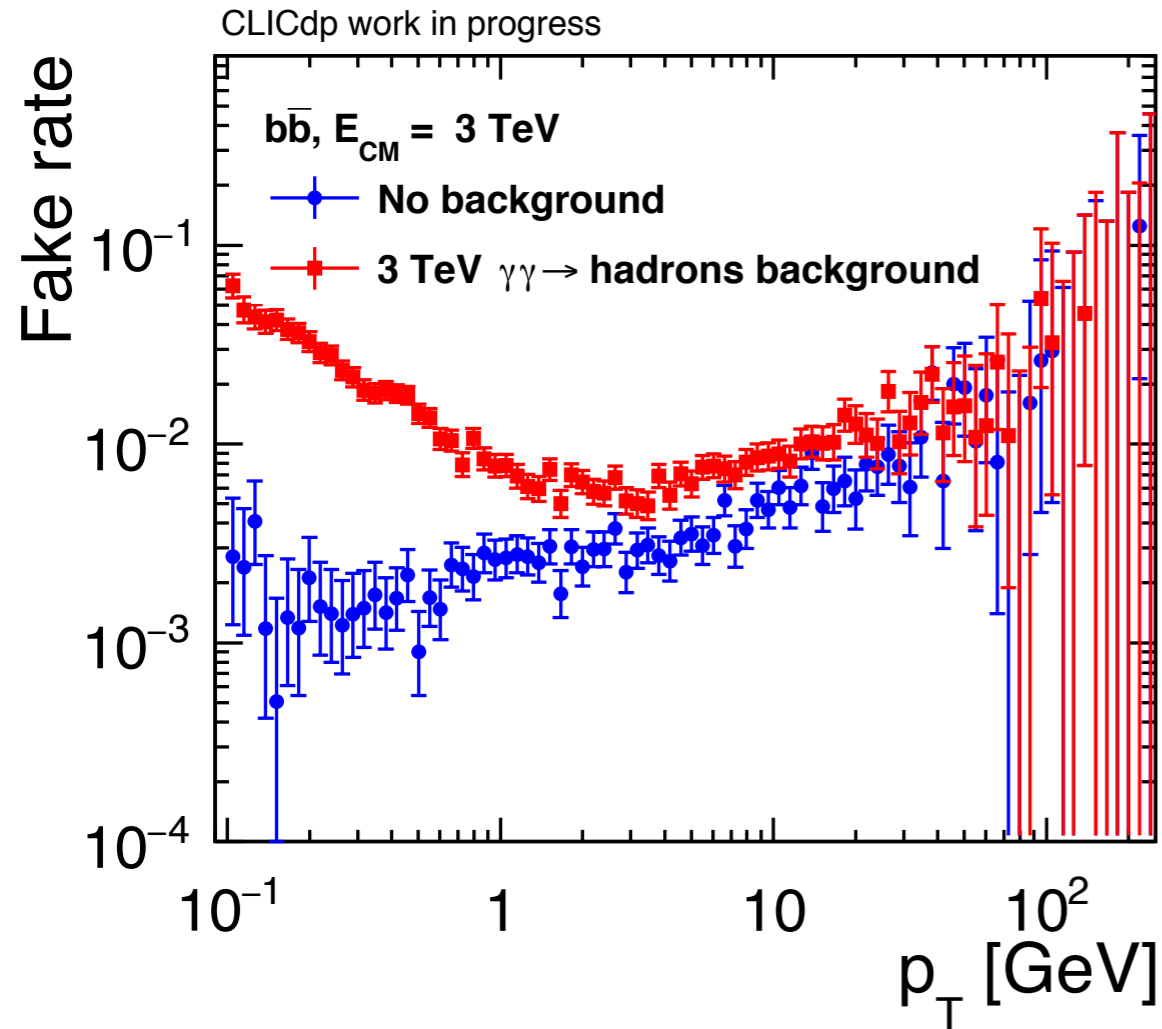
- Not a pattern recognition issue
- Hits removed by the fit
- expected position further than measured



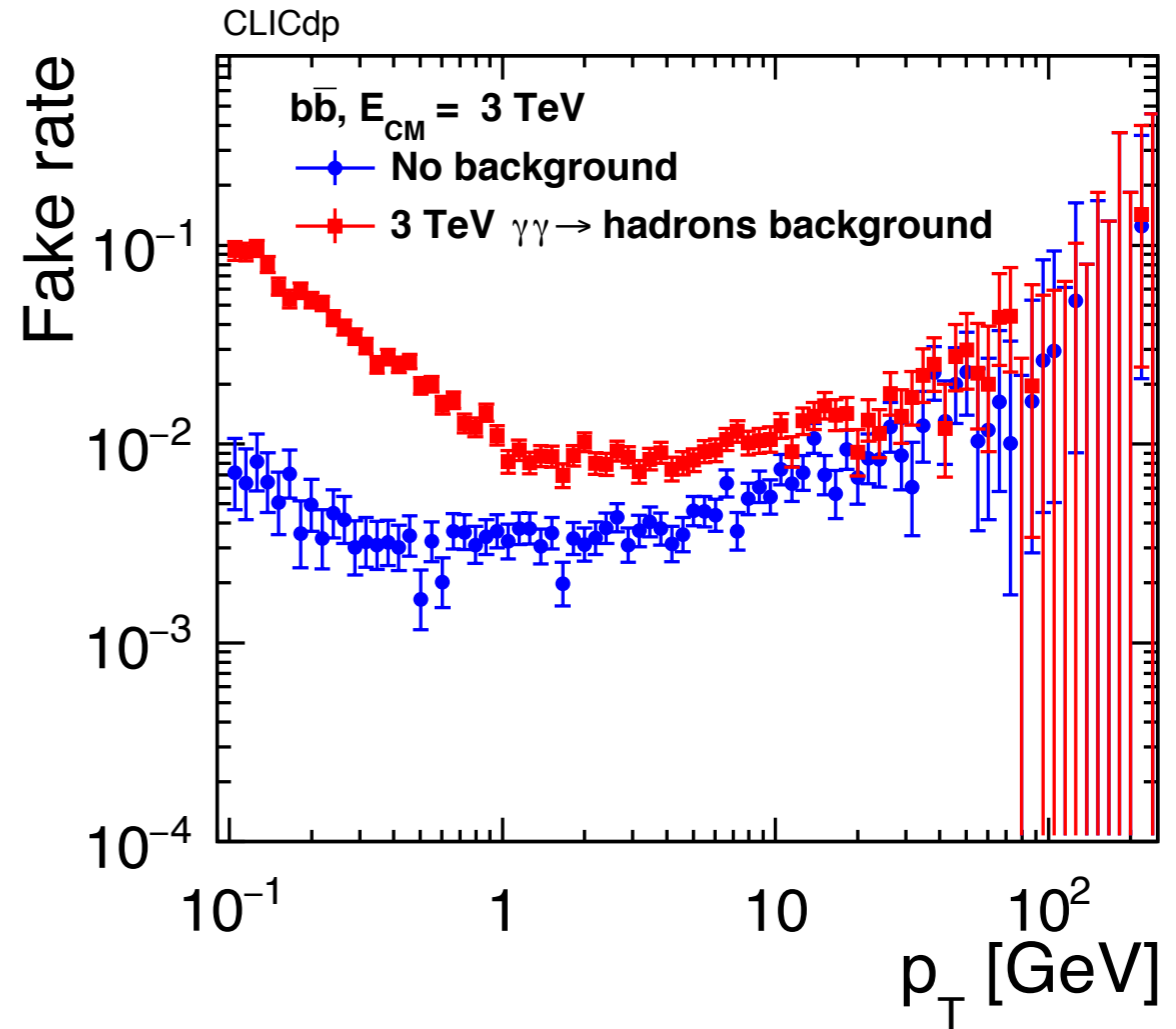




iLCSoft_2018-10-11

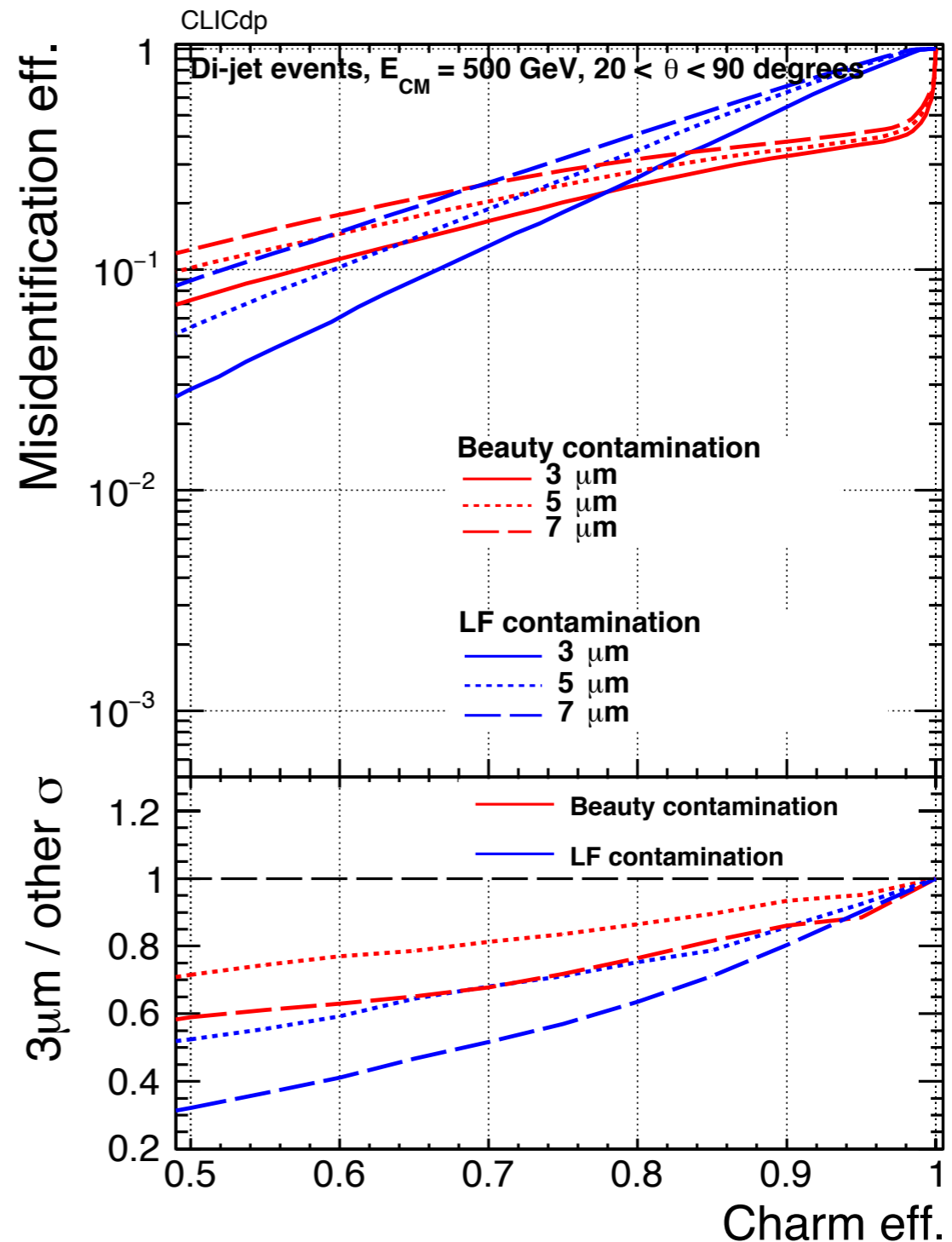
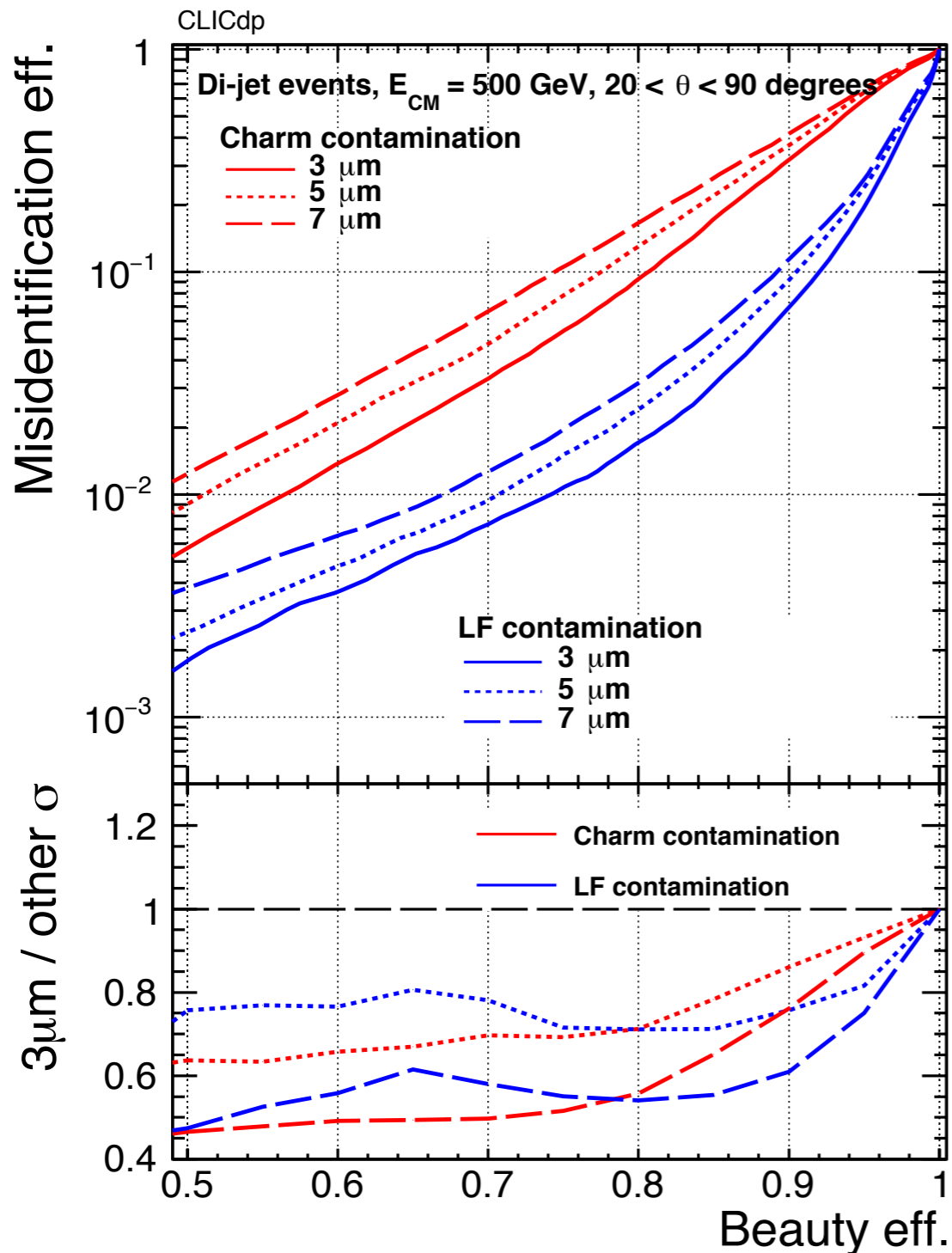


iLCSoft_2018-11-01



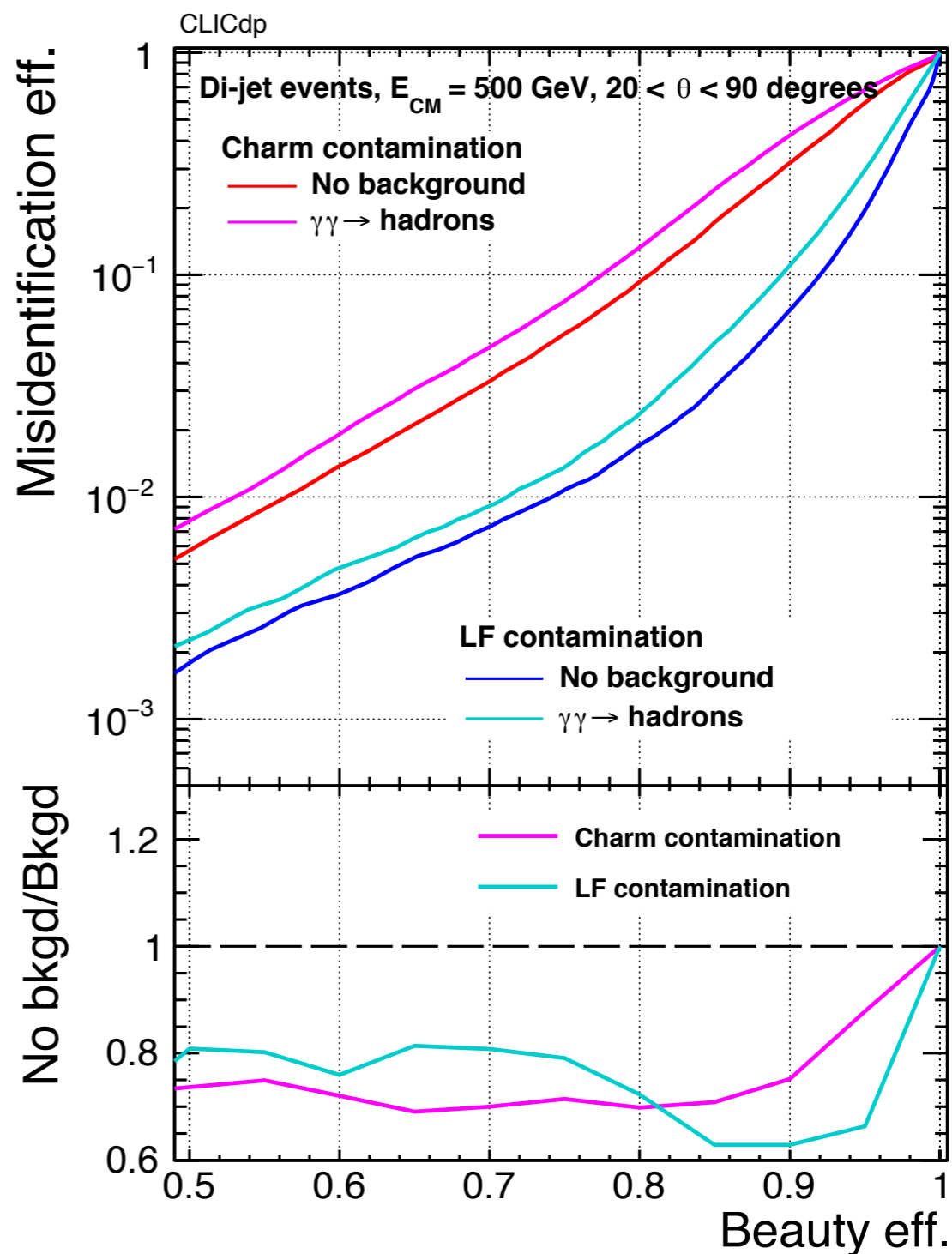
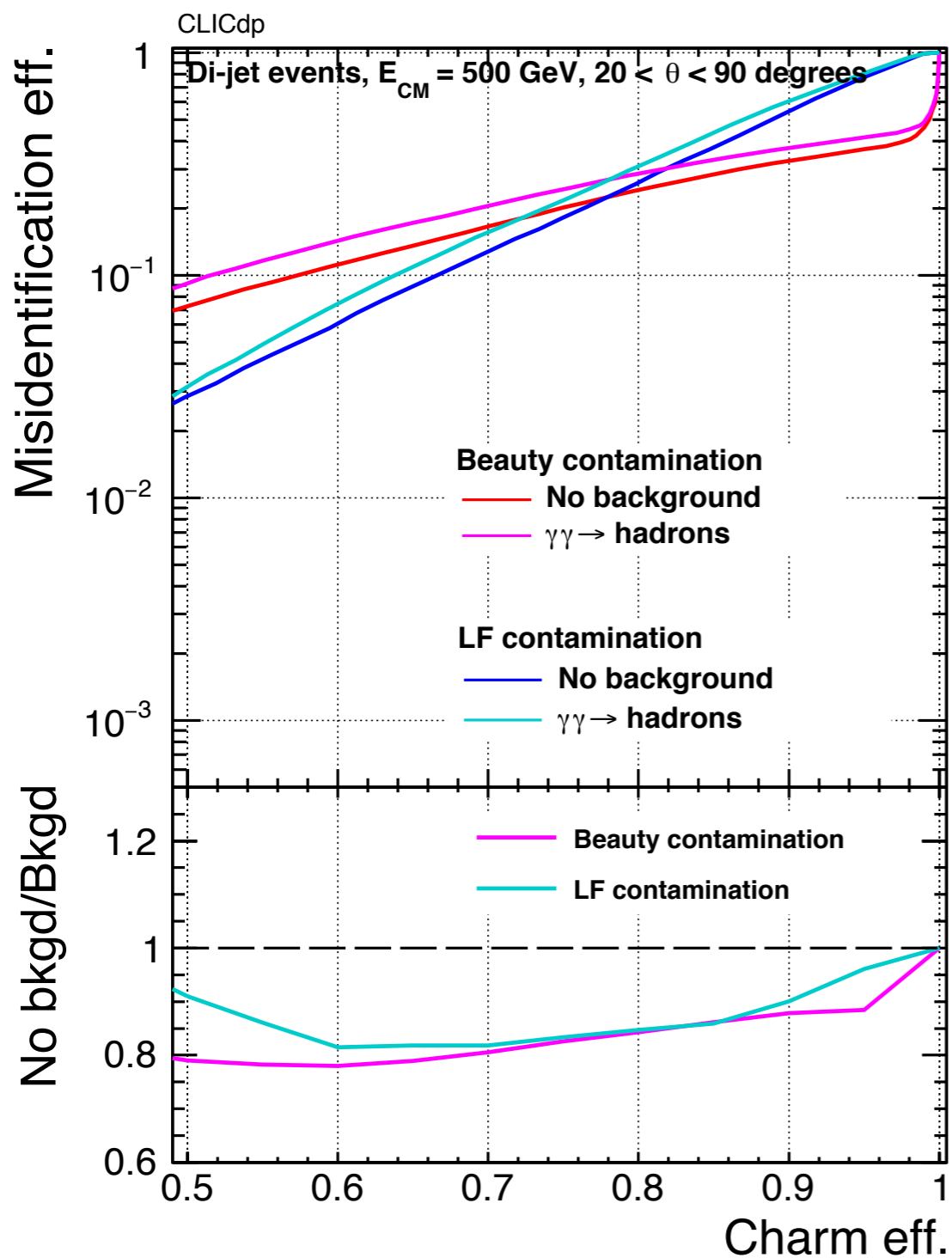


Flavour tagging / performances (I)



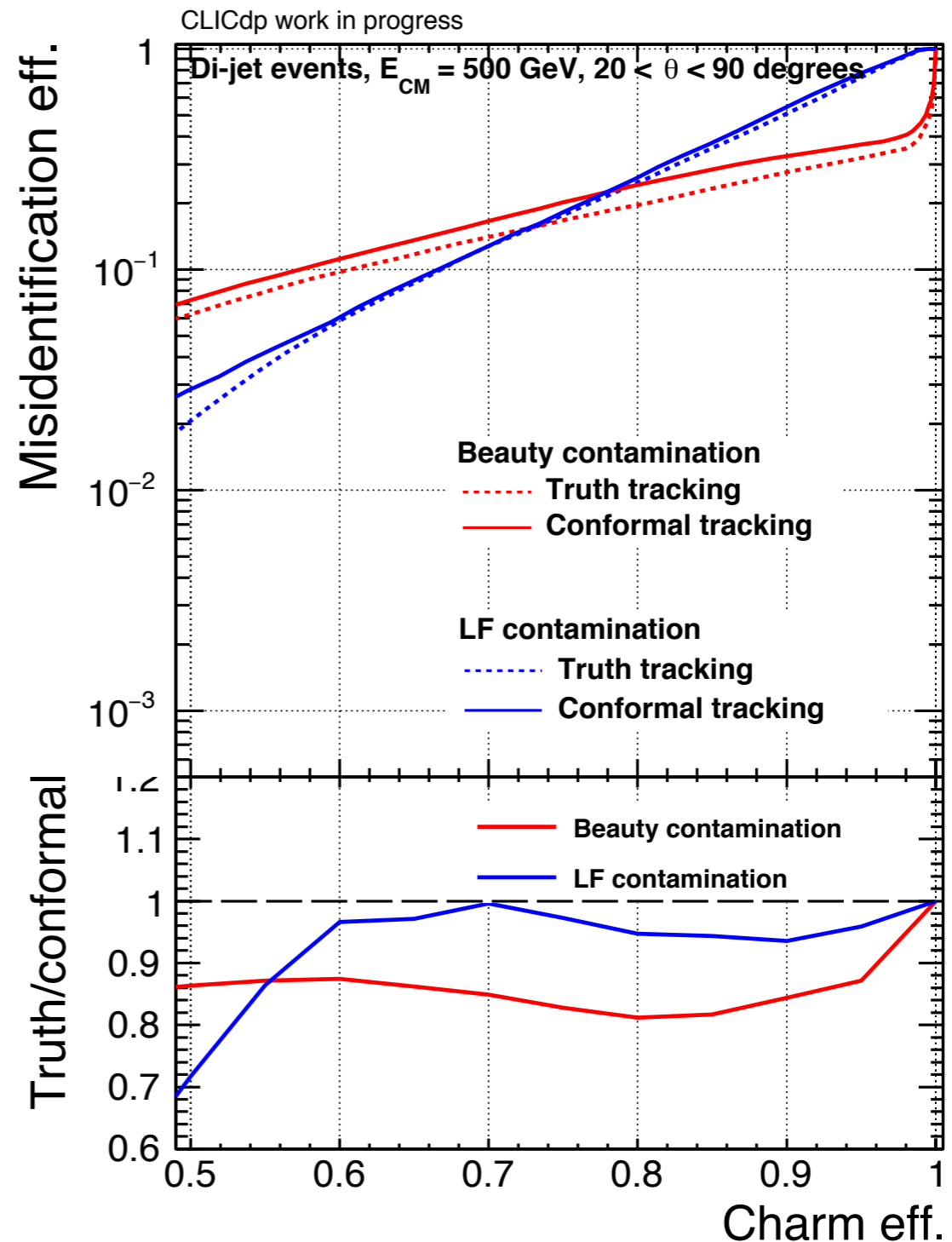
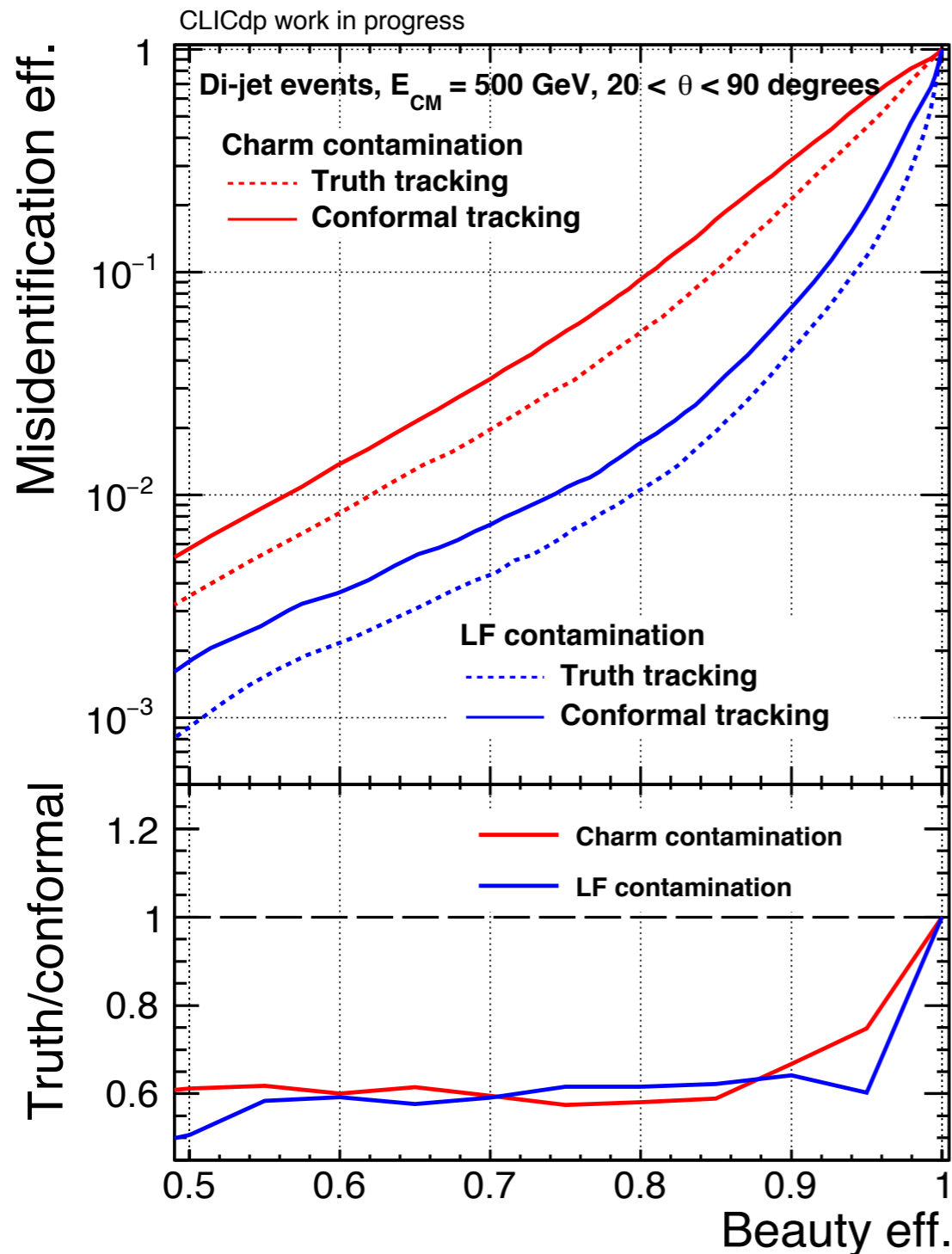


Flavour tagging / performances (II)





Flavour tagging / performances (III)





Flavour tagging / next steps



- Effect of tracking improvements on flavour tagging performances
- Systematic study of variation of LCFIPlus parameters
 - current studies performed with vertex constrained using ILC beam parameters —> to be changed to CLIC beam
 - optimization of the TMVA
- Study vertex position resolutions



Extras