

Tracking performances in the presence of pair background

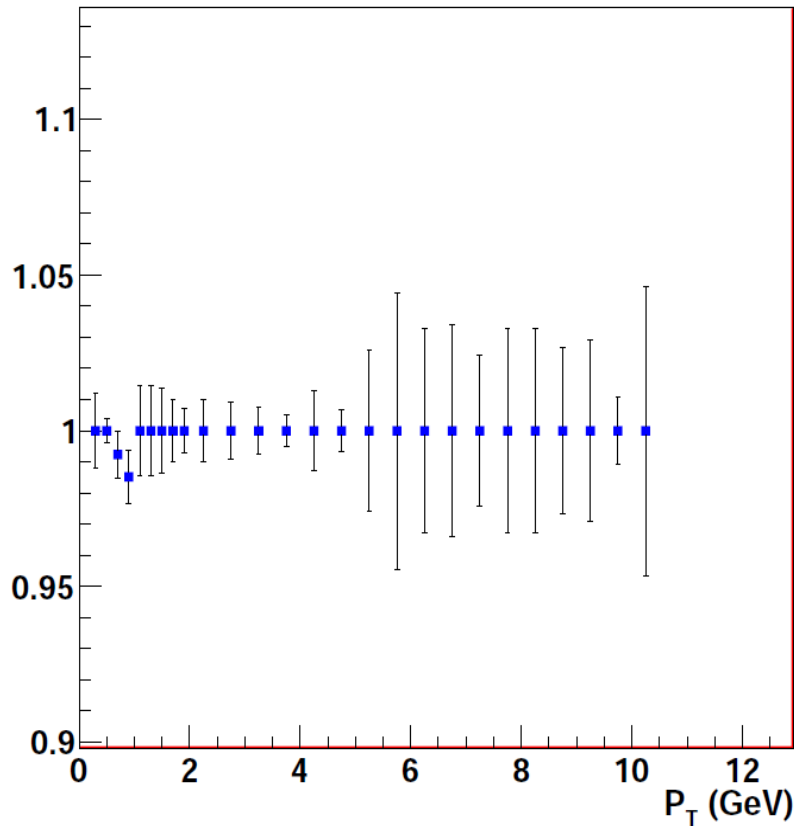
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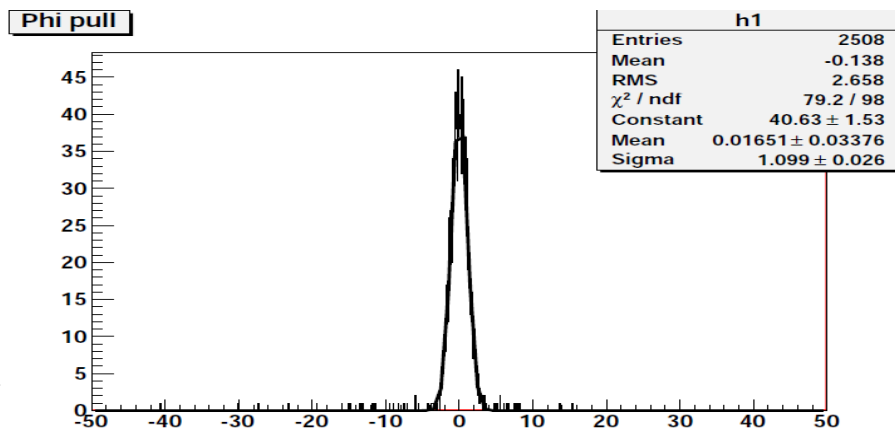
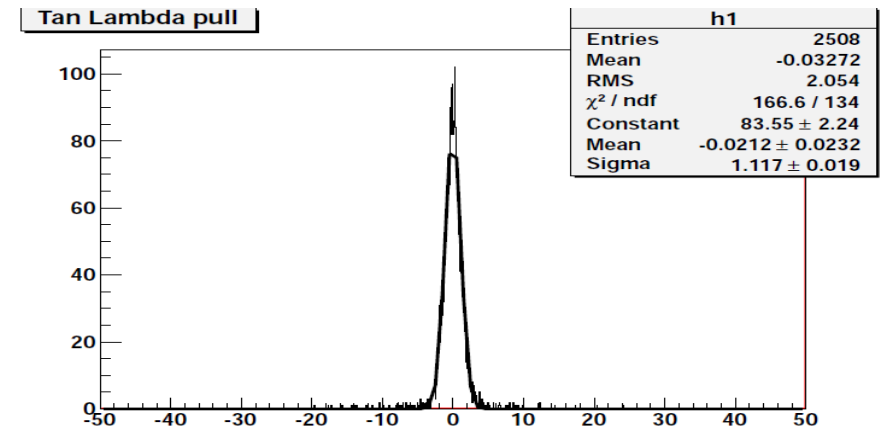
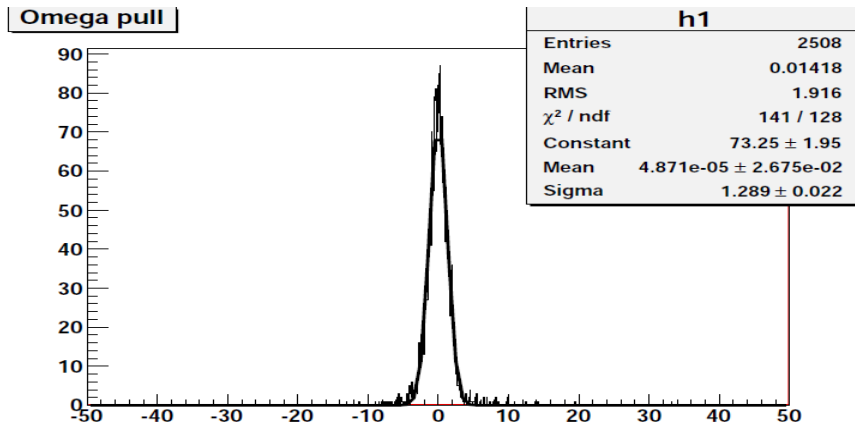
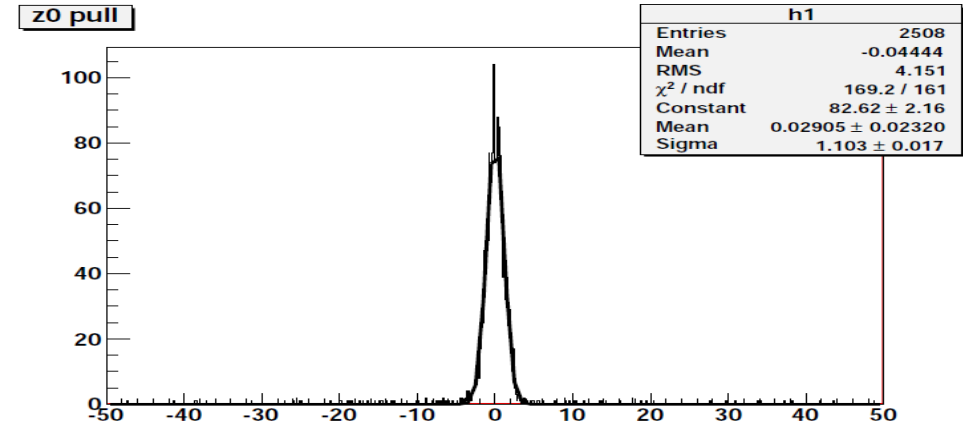
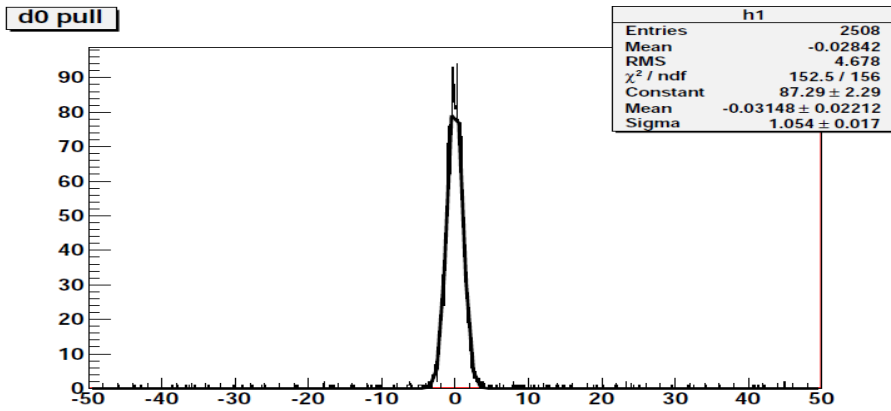
Tracking Efficiency

Tracking efficiency for single muons + pair bkg

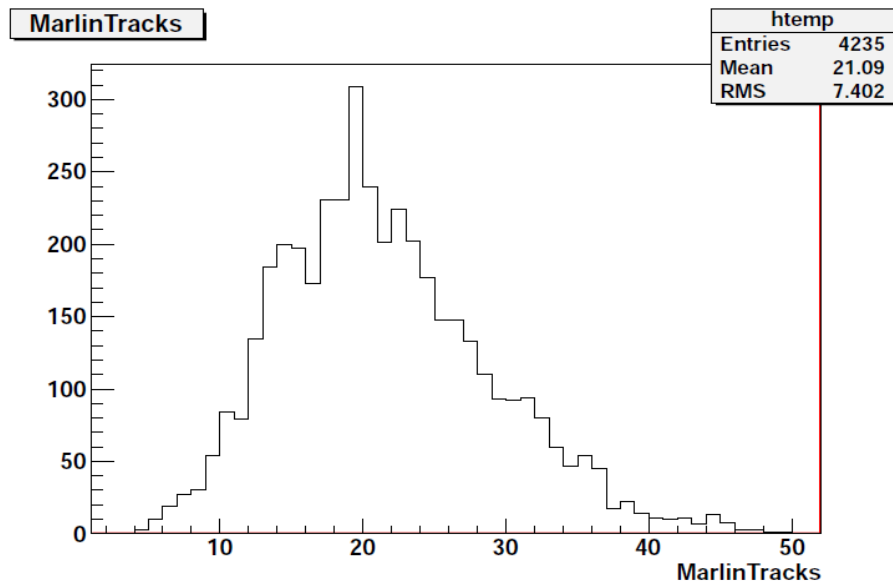


- Single muon tracks, various momenta, polar – azimuth angle
- TPC reconstruction: Clupatra
 - Additional cuts (to remove bkg tracks)
 - × $\text{Max } Z_0 < 50 \text{ mm}$
 - × $P_T > 200 \text{ MeV}$
 - × $|z|/388 - 0.1 < \tan\lambda < |z|/388 + 0.1$
- Silicon tracking
 - Modifications to remove bkg track
 - Seeds formation restricted to SIT and outer VXD layer
- Full Tracking
 - > 10 TPC hits, $P_T > 300 \text{ MeV}$
- Efficiency – purity evaluation based to LCRelation with the Monte Carlo particle
- Beam background
 - Overlay processor
 - $\sqrt{s} = 1 \text{ TeV}$

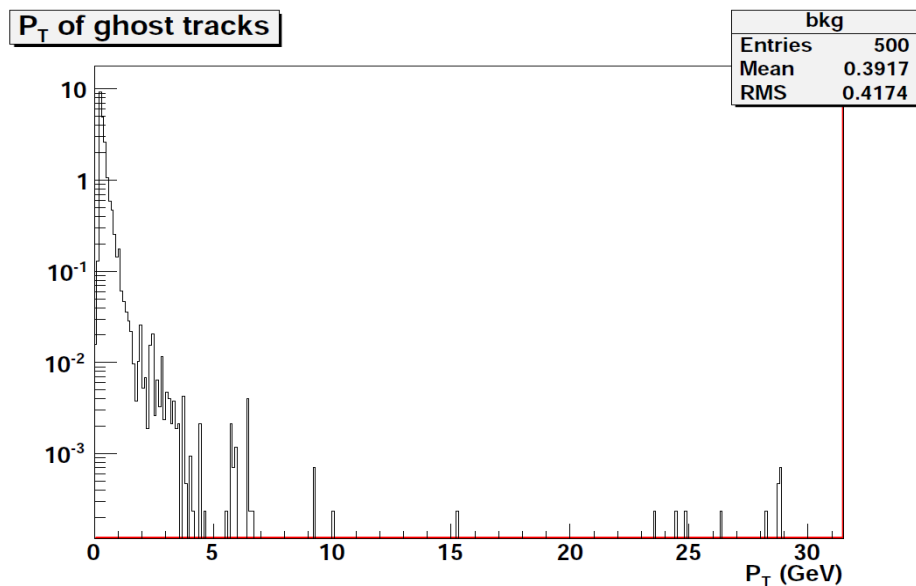
Parameter Pulls



Background Tracks at $\sqrt{s} = 1$ TeV

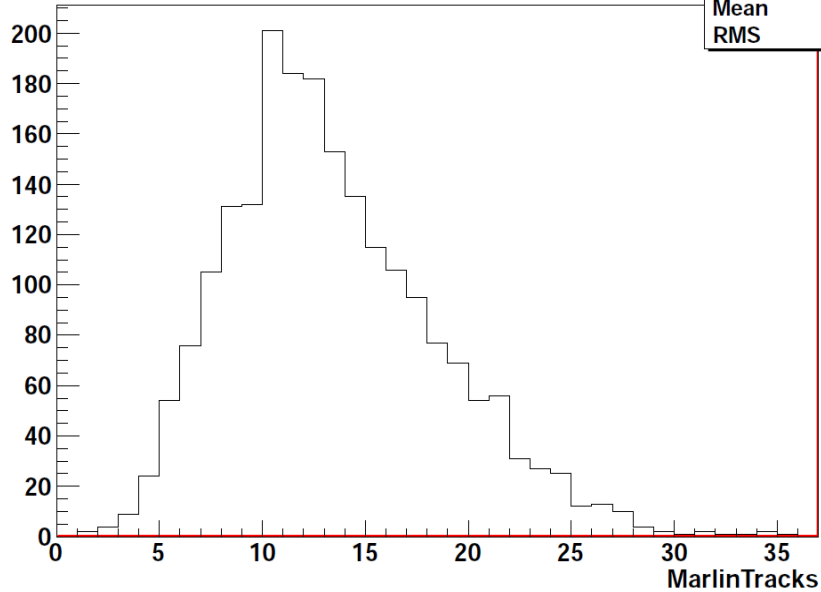


- ~ 20 bkg tracks / event
- Mostly low P_T
 - < 0.8 tracks with $P_T > 1$ GeV
- Effort to minimise them
 - TPC: testing various cuts
 - Silicon: try to suppress ghosts



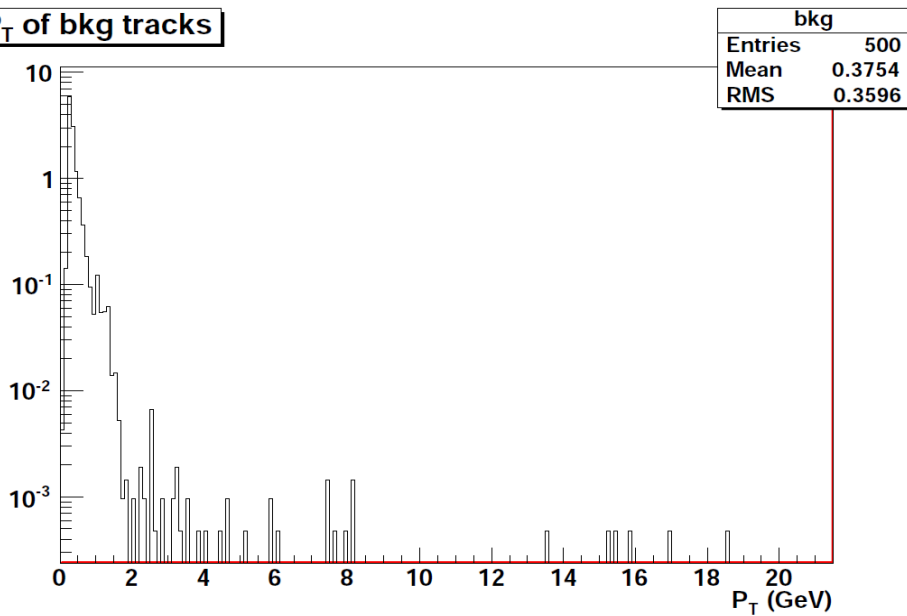
Study for $\sqrt{s} = 500$ GeV

MarlinTracks



- ~ 12 bkg tracks / event
- Mostly low P_T
 - ~ 0.4 tracks with $P_T > 1$ GeV

P_T of bkg tracks



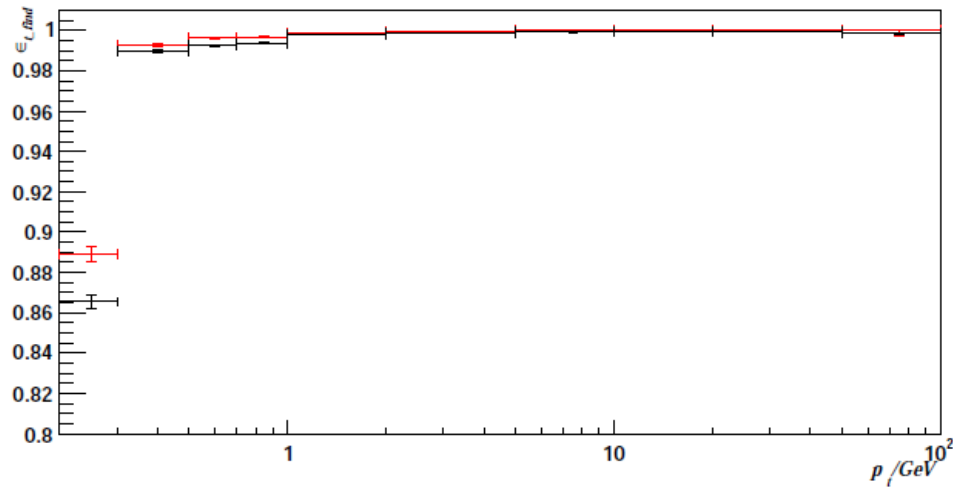
Track finding efficiency for ttbar

- ttbar tracking efficiency from Frank
 - Std reconstruction steering file – no additional Clupatra cuts
 - Only silicon tracking modified
 - ✓ Study the trade off between efficiency – rate of bkg tracks

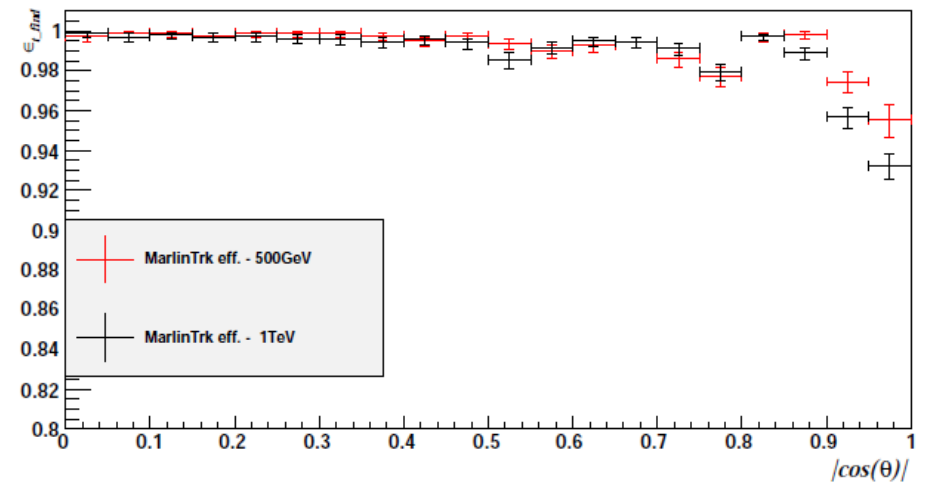
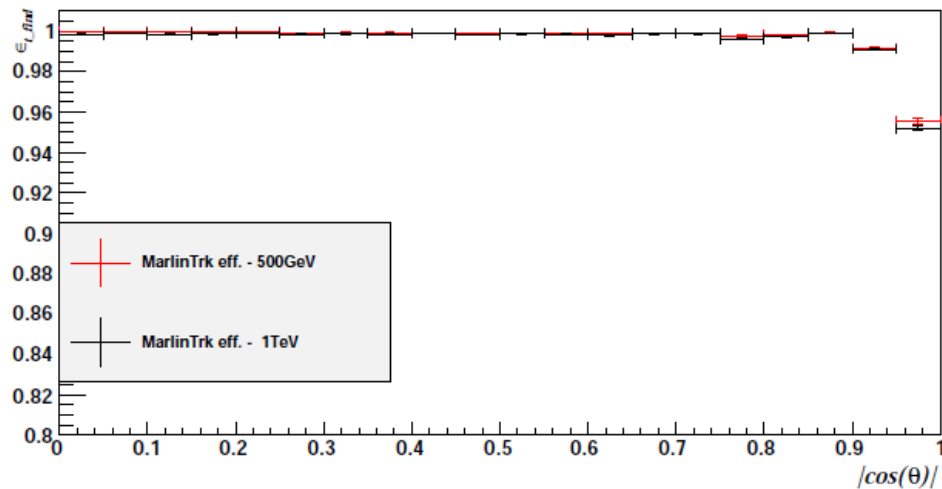
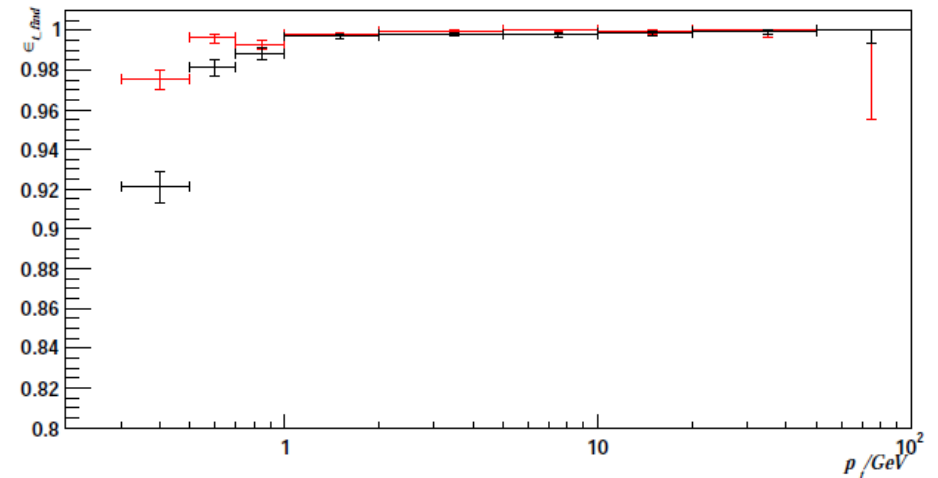
No pair bkg

pair bkg added

MarlinTrk track finding efficiency - $t\bar{t}$ @ 500/1000 GeV



MarlinTrk track finding efficiency - $t\bar{t}$ @ 500/1000 GeV w/ pair bg



Summary – Outlook

- Efficiency
 - We find the tracks, even at low momentum
 - The pull distributions show that the track is reconstructed correctly
- Pair bkg tracks
 - They are real tracks
 - TPC
 - Studying several variables that may allow us discriminate and reject pair bk tracks
 - Silicon
 - Focus on rejecting tracks arising from random hit combinations