# Status of Tracking Package FTD Related Issues

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Issues raised at previous phone meetings

- Degradation of track efficiency in the forward region for LDC01_06Sc_p01 and LDCPrime_02Sc_p01 models

- Constant thickness for all FTD's (last four layers are supposed to be thicker), support disks (kapton) instead of rings ⇒ appropriate modifications in Mokka and MaterialDB processor must be implemented

- Inner radii of FTD disks in LDC01_06Sc_p01 and LDCPrime_02Sc are smaller than in LDC01Sc ⇒ larger overlap with e^+e^- pair background cone !

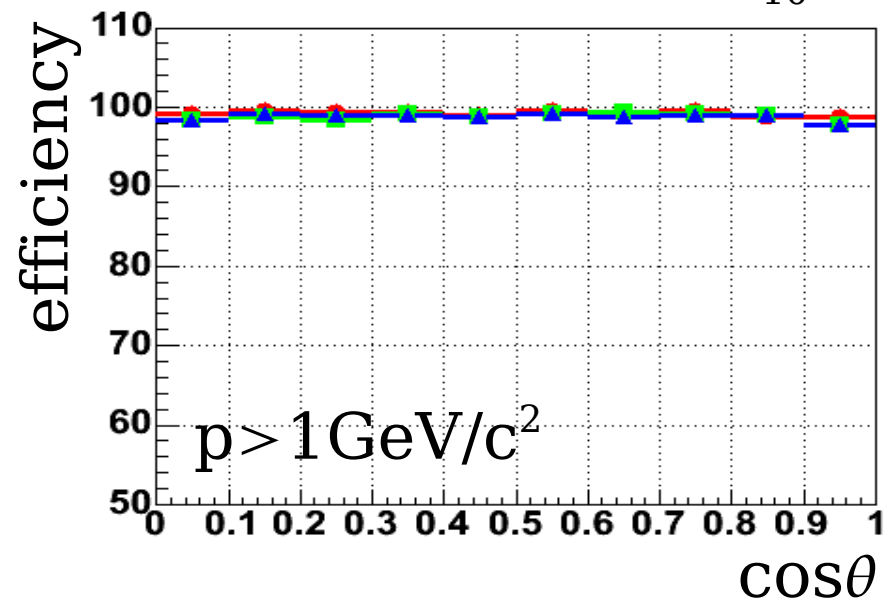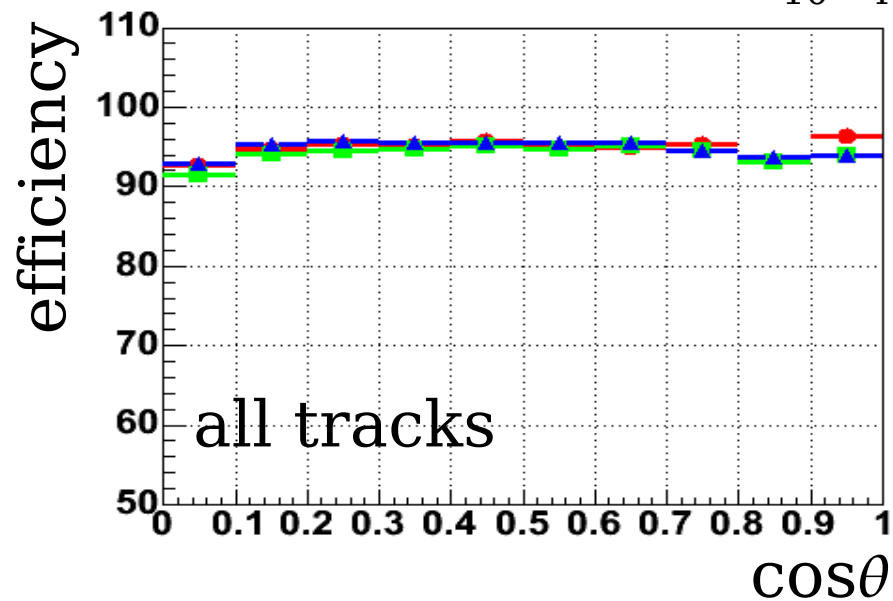# Tracking Efficiency. LDCPrime_02Sc (last ILD meeting)
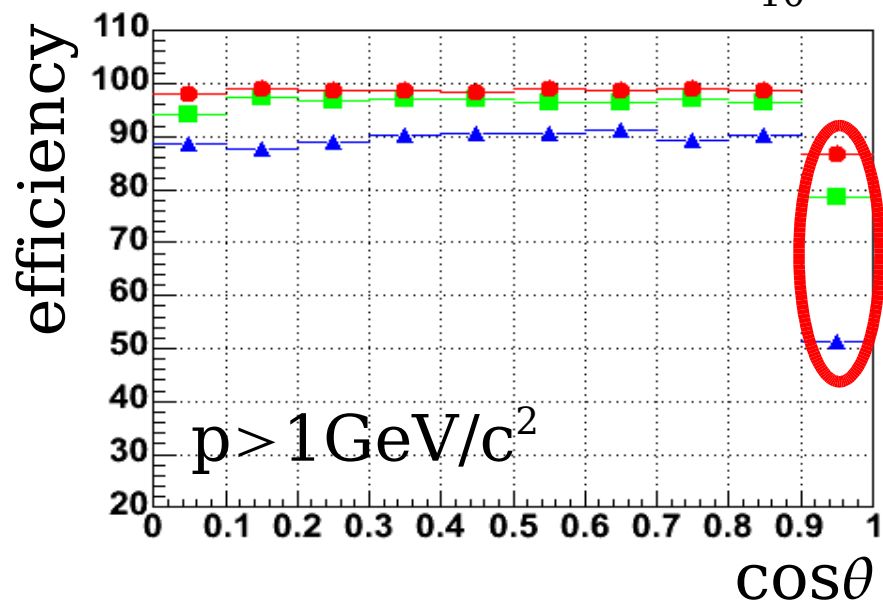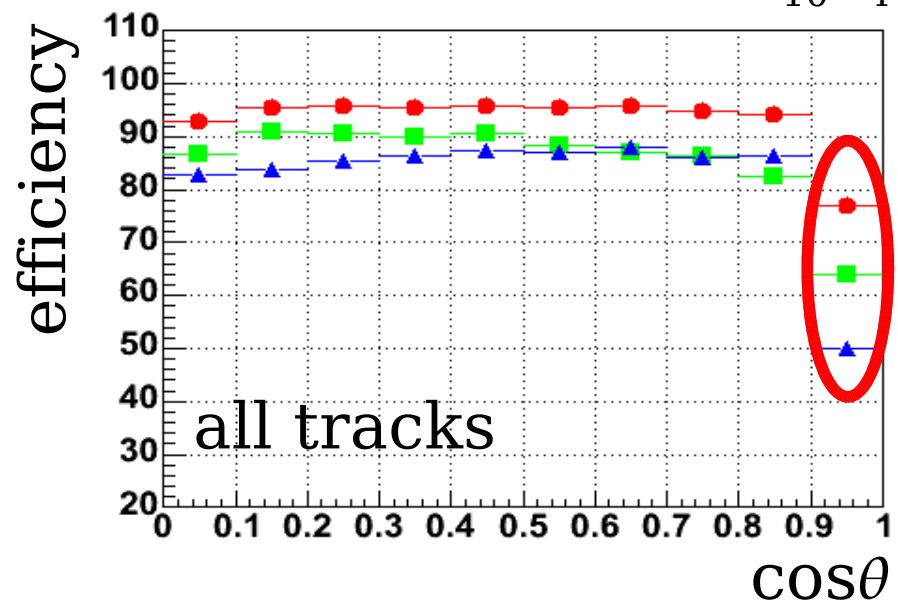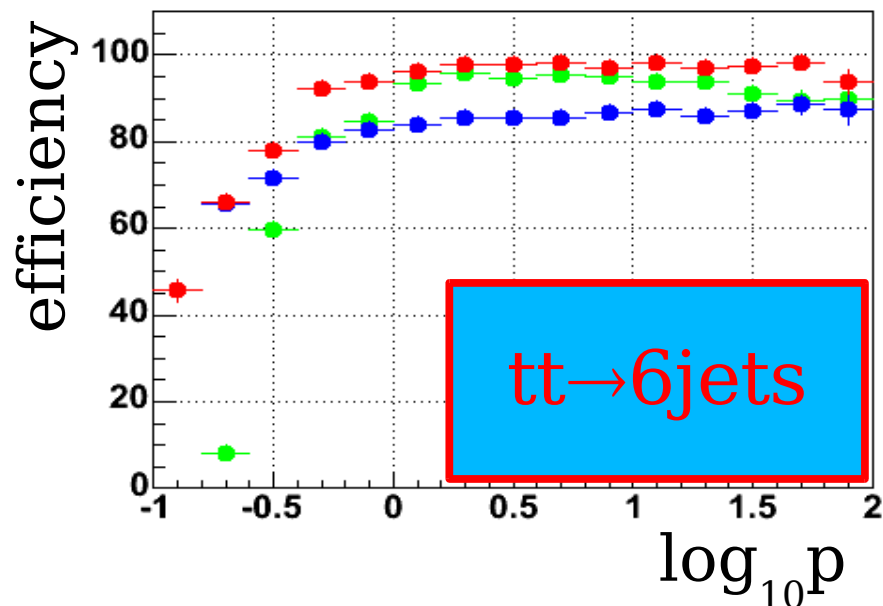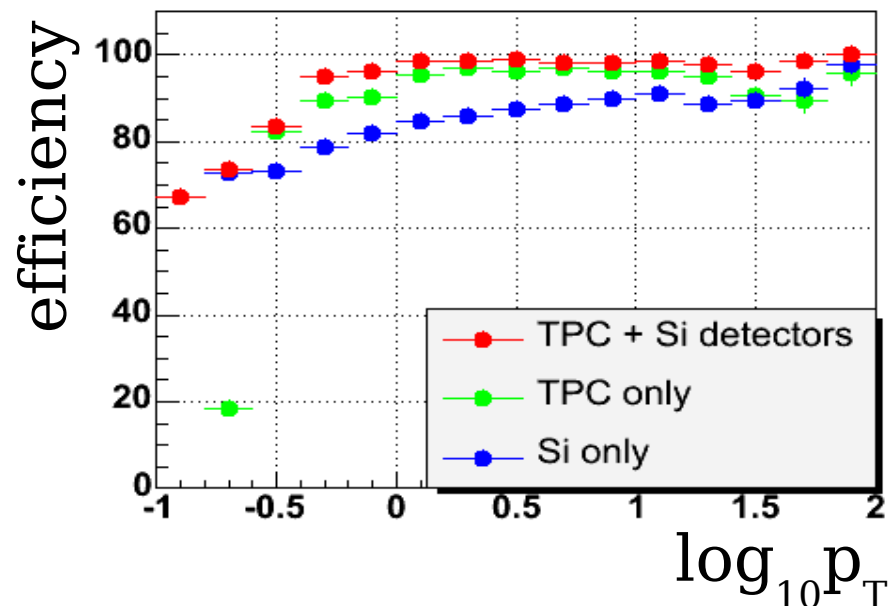
Degradation of Efficiency Reasons & Remedy

- Steering parameters of SiliconTracking were optimized for LDC01 model, extremely non-optimal for LDC01_06Sc and LDCPrime_02Sc (new FTD geometry)

  - Set of layer combinations used to search for hit triplets had to be adjusted for the new Mokka models

- Steering parameters of SiliconTracking have been reoptimized for new Mokka models ⇒ updated default processor parameters

  - Version of SiliconTracking with new default processor parameters has been submitted to CVS

Tracking Efficiency. LDCPrime_02Sc (After reoptimization)
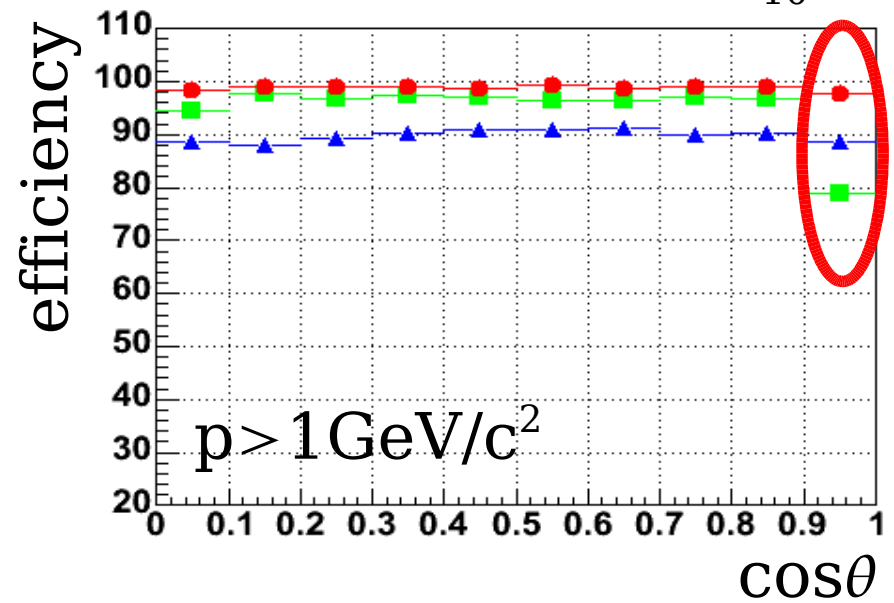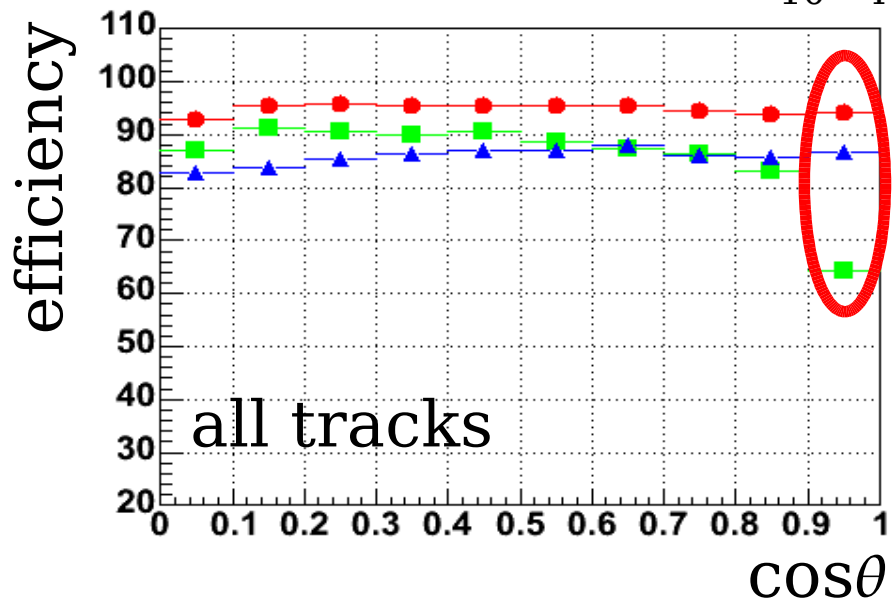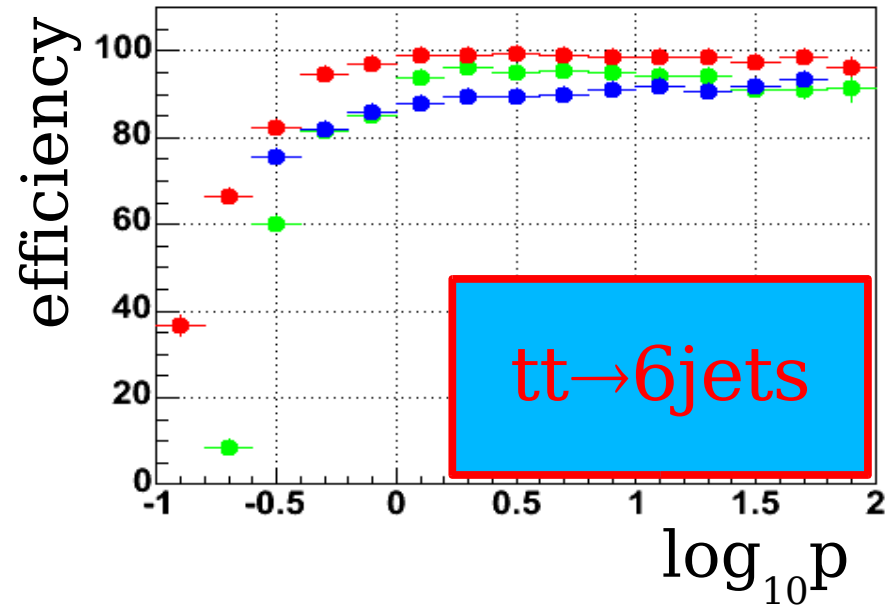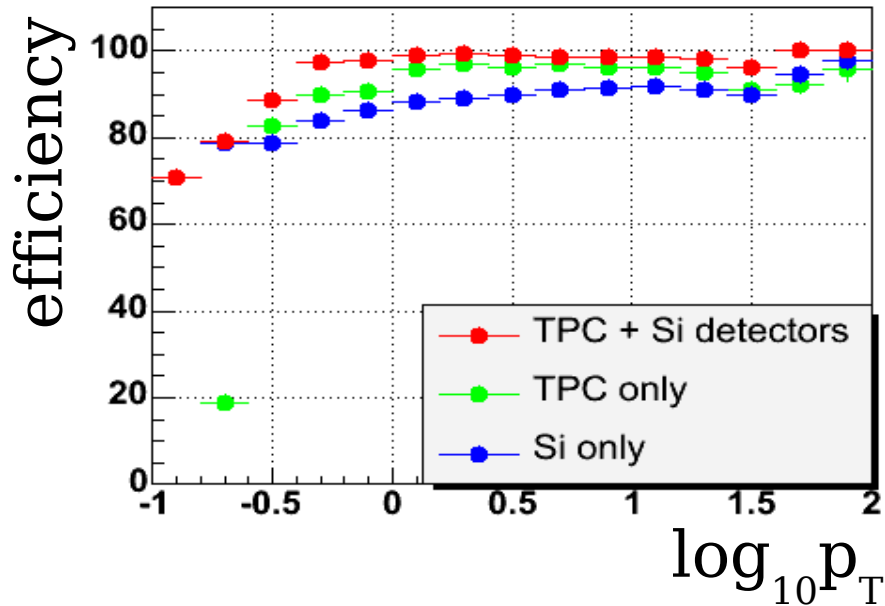
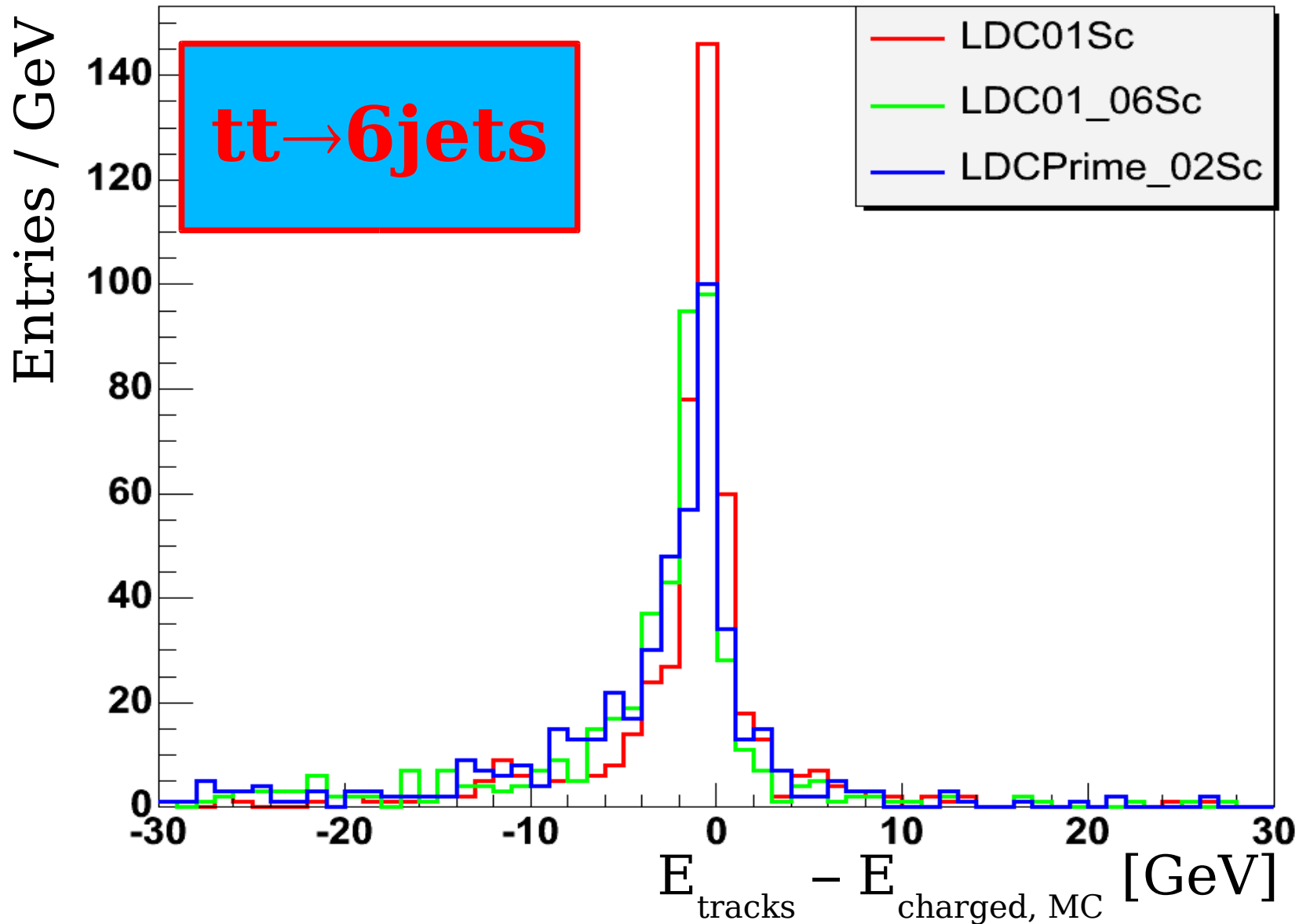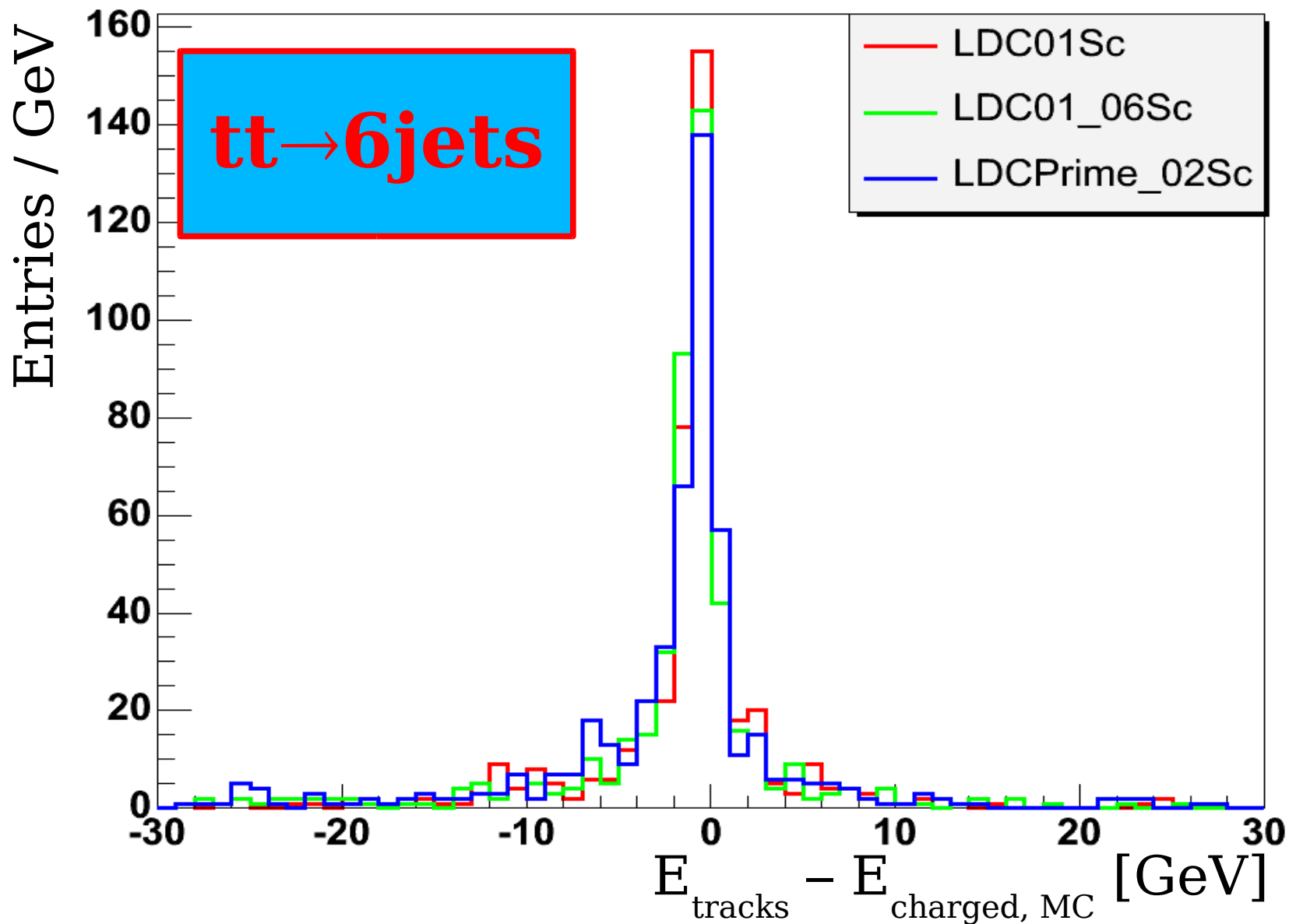# Tracking Efficiency. Comparisons (After reoptimization)
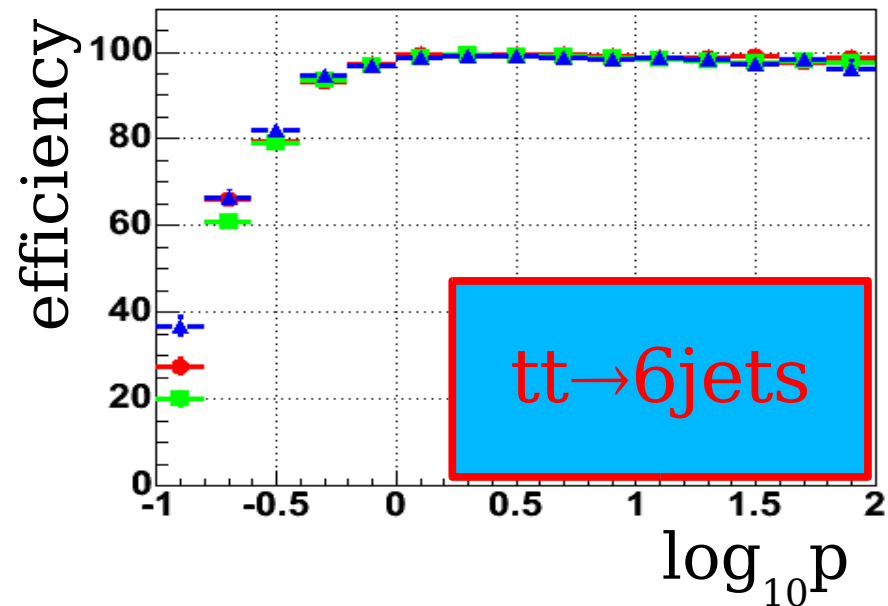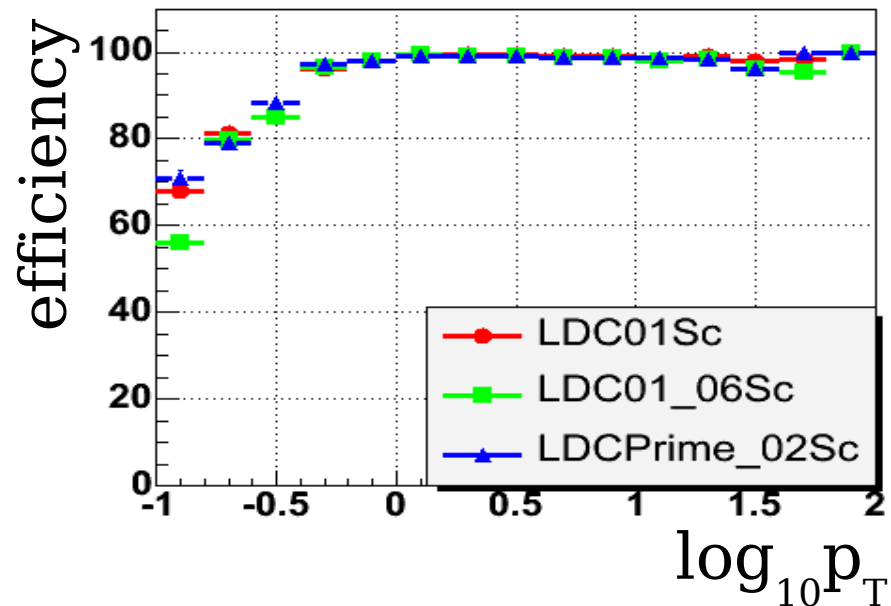
Energy in Tracks
(last meeting)

Reco - True energy, GeV

tt→6jets

LDC01Sc
LDC01_06Sc
LDCPrime_02Sc

Entries / GeV

$E_{tracks} - E_{charged,\ MC}$ [GeV]

Energy in Tracks (after reoptimization)

New FTD Geometry

- Variable thickness of FTD disks

    – Previously all disks had the same thickness : 50 μm

    – Should be :

    – disks 1-3 : 50μm; disks 4-7 : 275μm

- Support disks (kapton) instead of rings

    – Thickness => disks 1-3 : 1mm; disks 4-7 : 1.5mm

- Driver FTD01.cc, Mokka database and MaterialDB processor are being modified by Steve to account for new FTD geometry

- New versions of FTD driver and Mokka database are still under development and testing

- First checks for forward tracks revealed no major problems

Diagnostics of New FTD model Pull & χ^2 Distributions
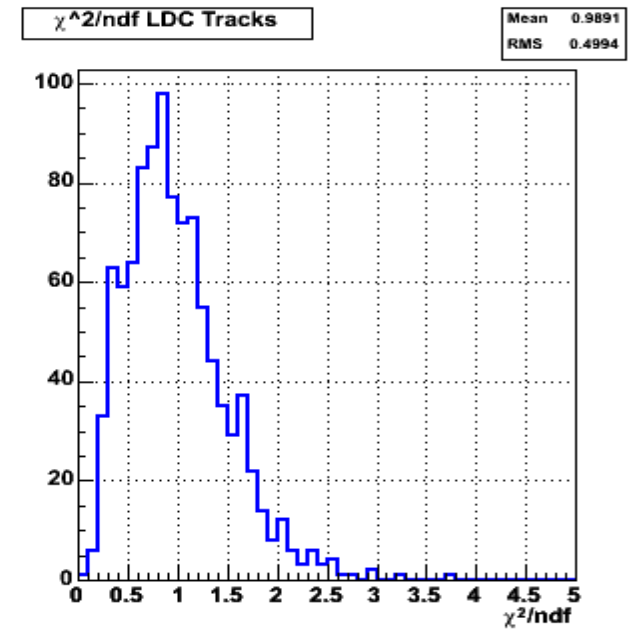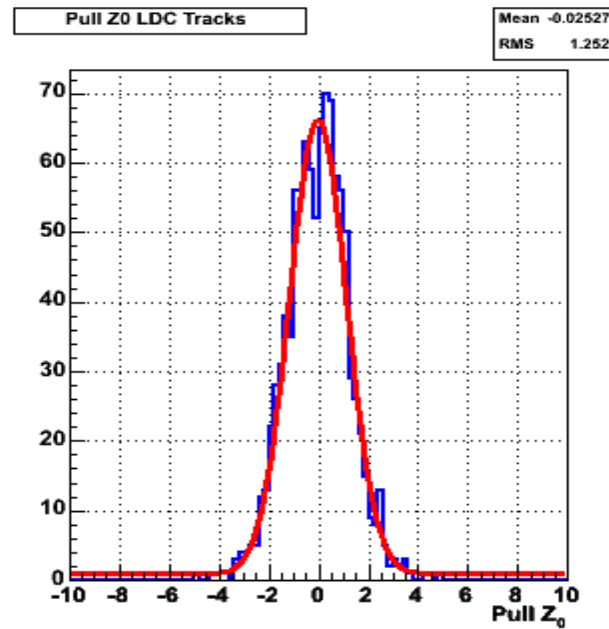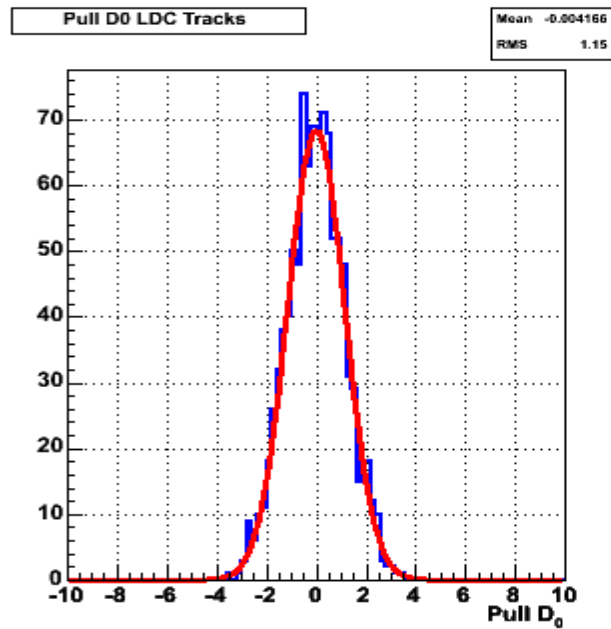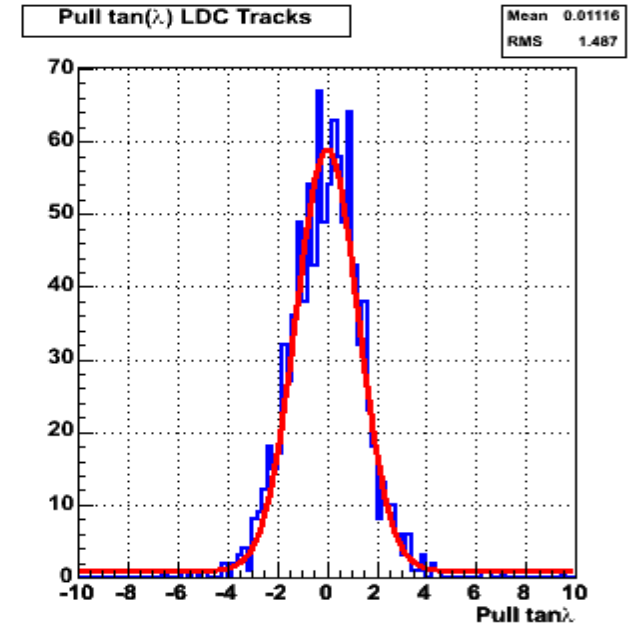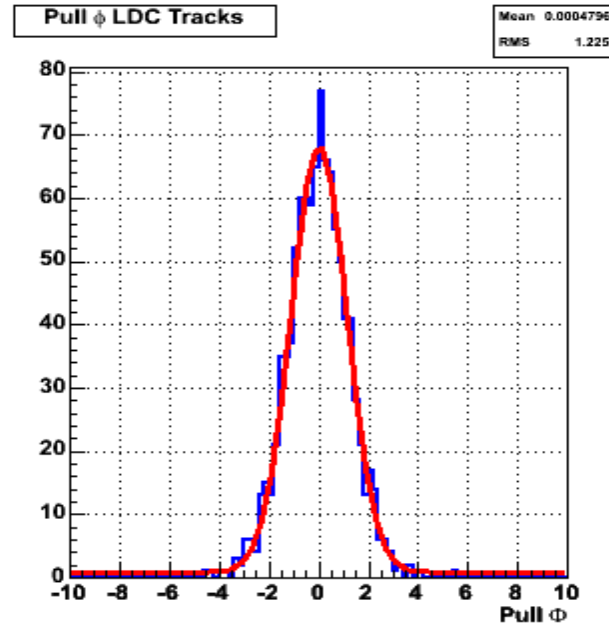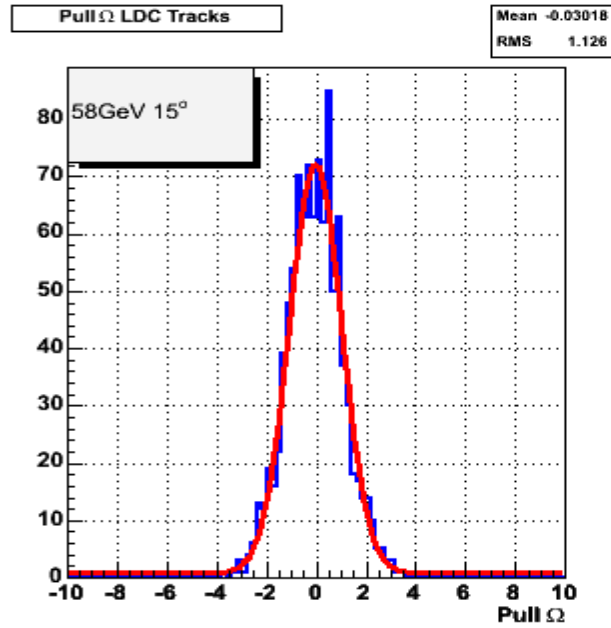
Track Parameter Resolutions for Forward Tracks

➔ Single muon events
➔ $\theta = 15^{\circ}$ (FTD only)
➔ uniform distribution in φ
➔ energy = [4..194] GeV
➔ spatial point resolution $10\mu m$

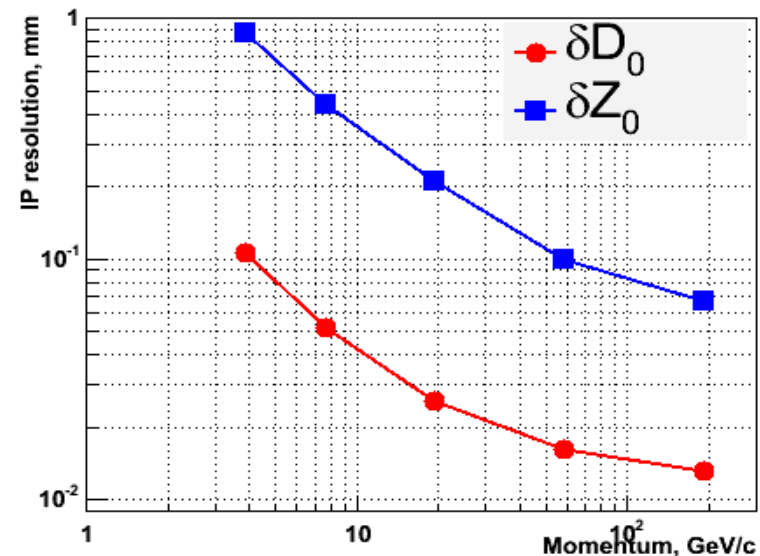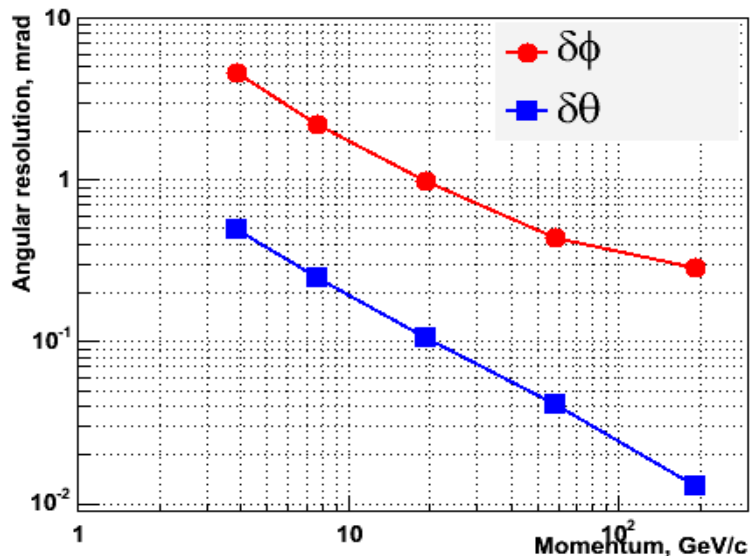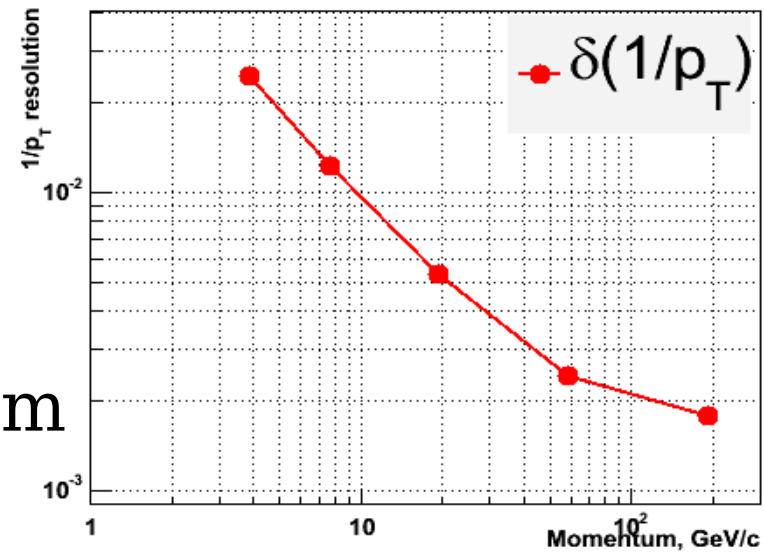# New FTD Model vs. Old

- Old model ⇒

Layer	1	2	3	4	5	6	7	
R_{in}	38	48	59	68	90	111	132	[mm]
R_{out}	140	140	210	270	290	290	290	[mm]
Z	200	320	440	550	800	1050	1300	[mm]

- New model ⇒

Layer	1	2	3	4	5	6	7	
R_{in}	29	34	48	83	113	144	174	[mm]
R_{out}	140	140	210	270	290	290	290	[mm]
Z	235	376	540	940	1292	1645	1997	[mm]

New model :   smaller inner radii in the first three disks ;
     larger distances from IP for all disks
   ⇒ larger coverage in θ (down to smaller angles)
   ⇒ larger overlap with e⁺e⁻ pair background cone

Should we keep present FTD parameters or return to the previous version?

FTD Acceptance
New vs. Old Model
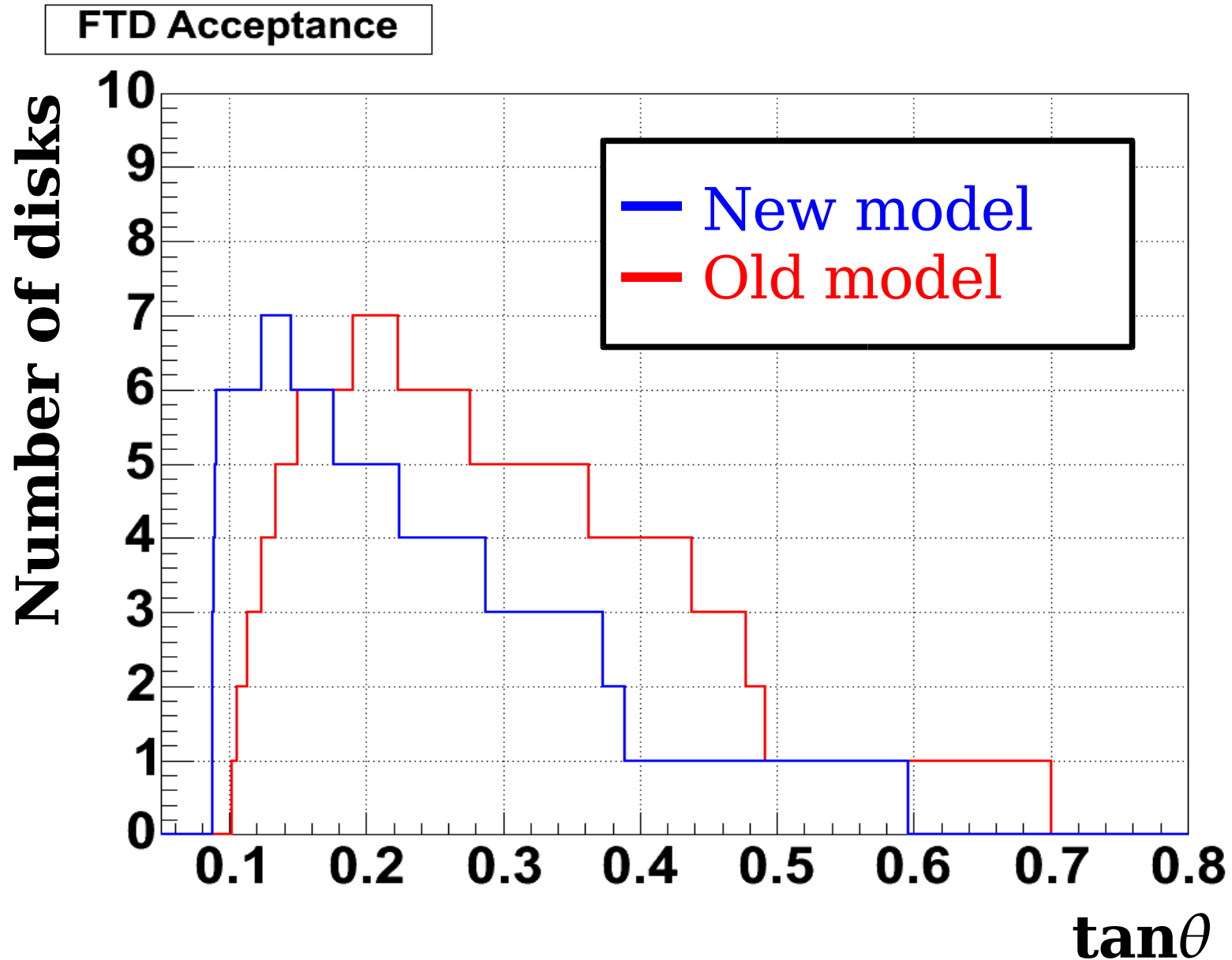
Summary

- New FTD model + Tracking yield good performance

  - track efficiency (forward region) > 97% (comparable with the old model)

  - Pull & are distributions are reasonable

  - Track parameter resolutions are OK

- Acceptance of the new FTD model extends to lower polar angles ⇒ larger overlap with e^+e^- pair background cone :

  - geometrical parameters of new FTD model need to be discussed and possibly reconsidered