

3rd Update on VXD Tracking Studies

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August 12, 2005

Quick Recap

- 500 GeV E_{cm} qqbar events.
- MC truth limited to 2-jet events in the central region, originating within the VXD. Minimum $p_T = 0$ GeV
- ~99.7% efficient* in the absence of gaussian hit smearing and realistic CCD simulation.

*Except at low p_T

Fixes on our end...

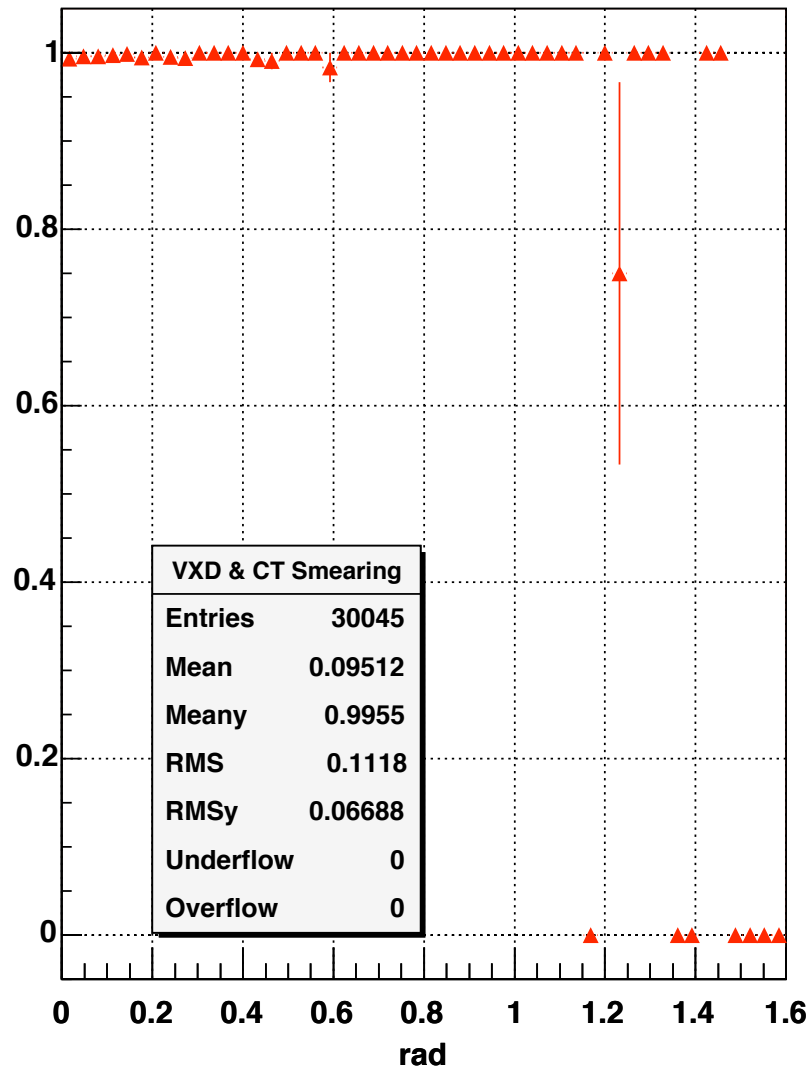
- Modified LCDTRK to use the same materials as described in the SDJan03 detector configuration. (Config. used to generate qqbar events).
- A beam constraint was mistakenly included in LCDTRK, but has now been removed.
- Additional care in finding precise bin centers (in p_T , and in $\cos \theta$) applied to LCDTRK calculations

Fixes on Nick's end...

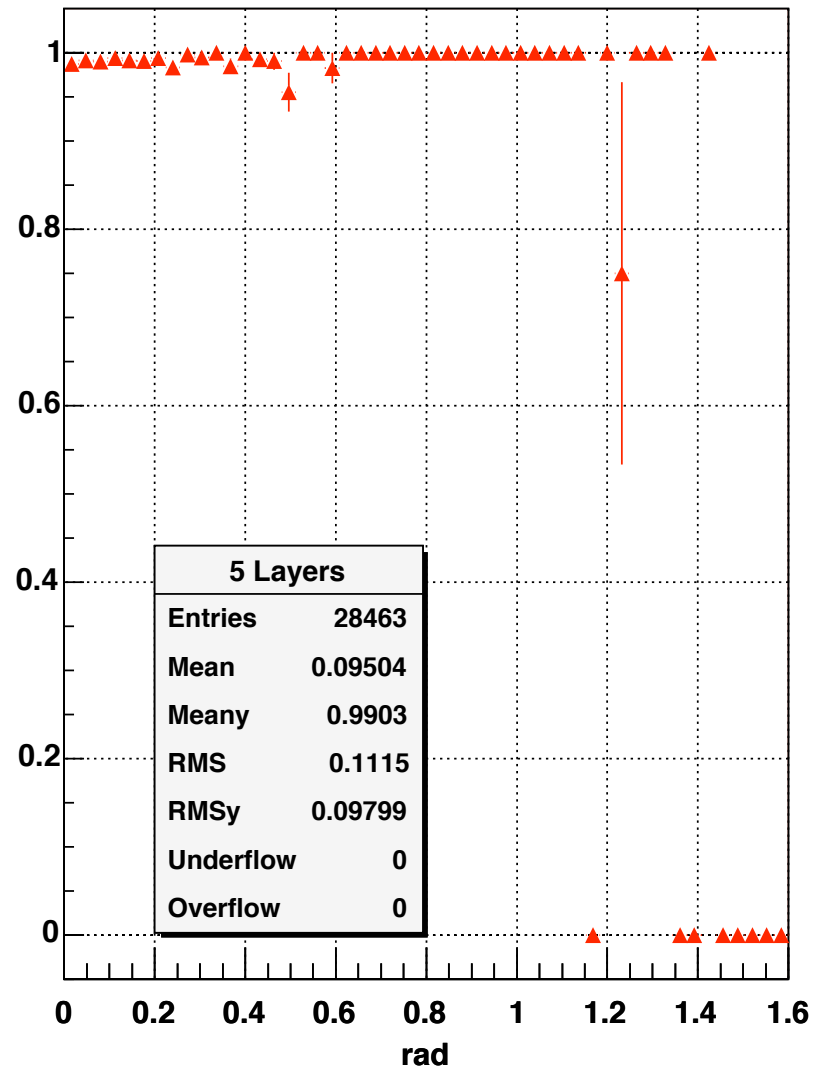
- Nick has posted fixes to both the pattern recognition and fitting routines.
- Today we'll look at the results of these fixes.
 - First, the results including the pattern recognition fixes:

qq-bar Efficiency

Efficiency vs. Abs(α)

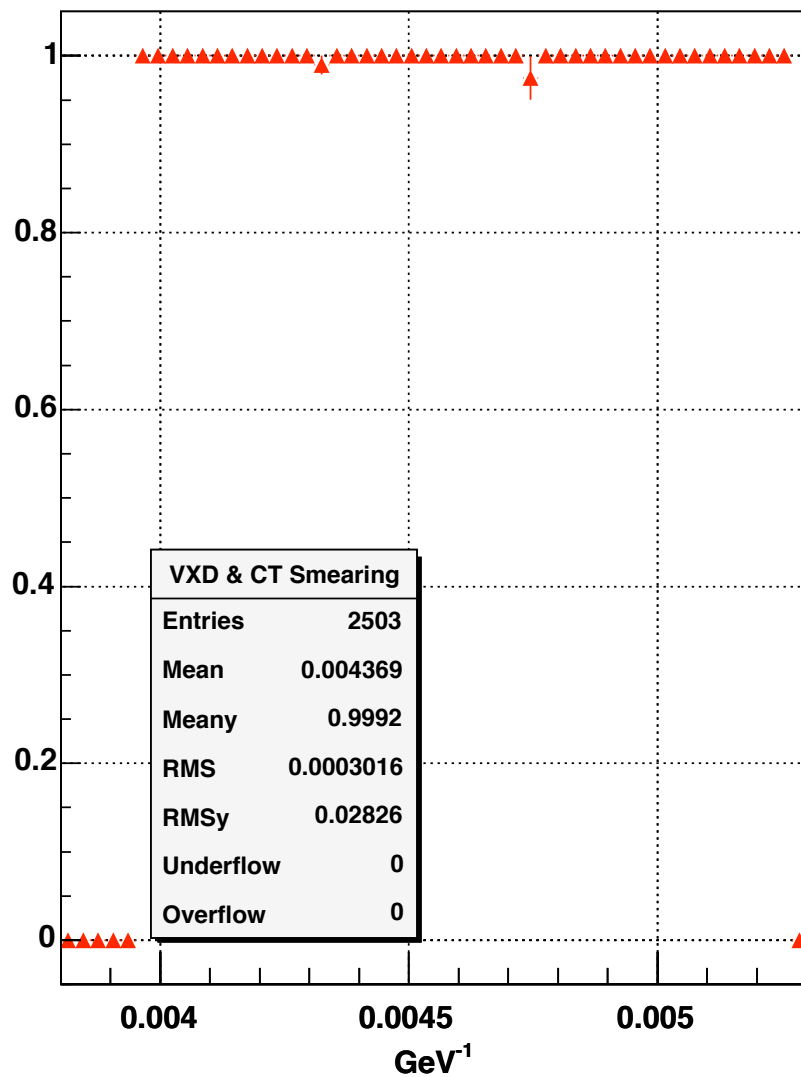


Efficiency vs. Abs(α)

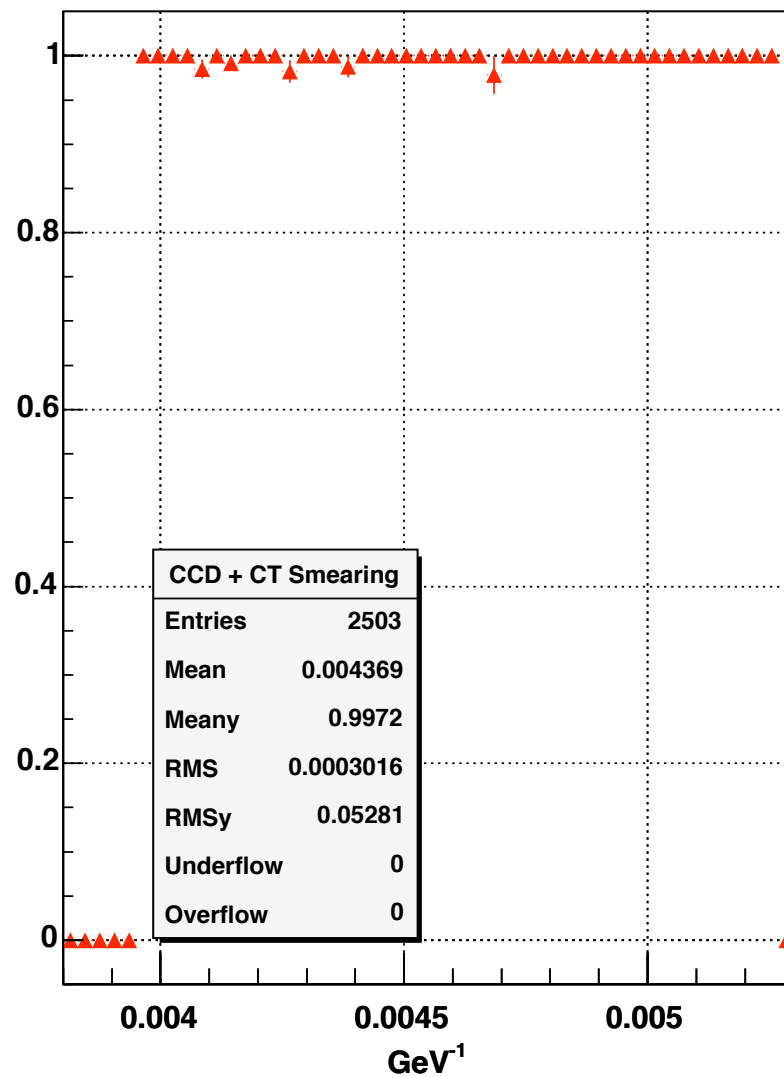


$\mu\mu$ Efficiency

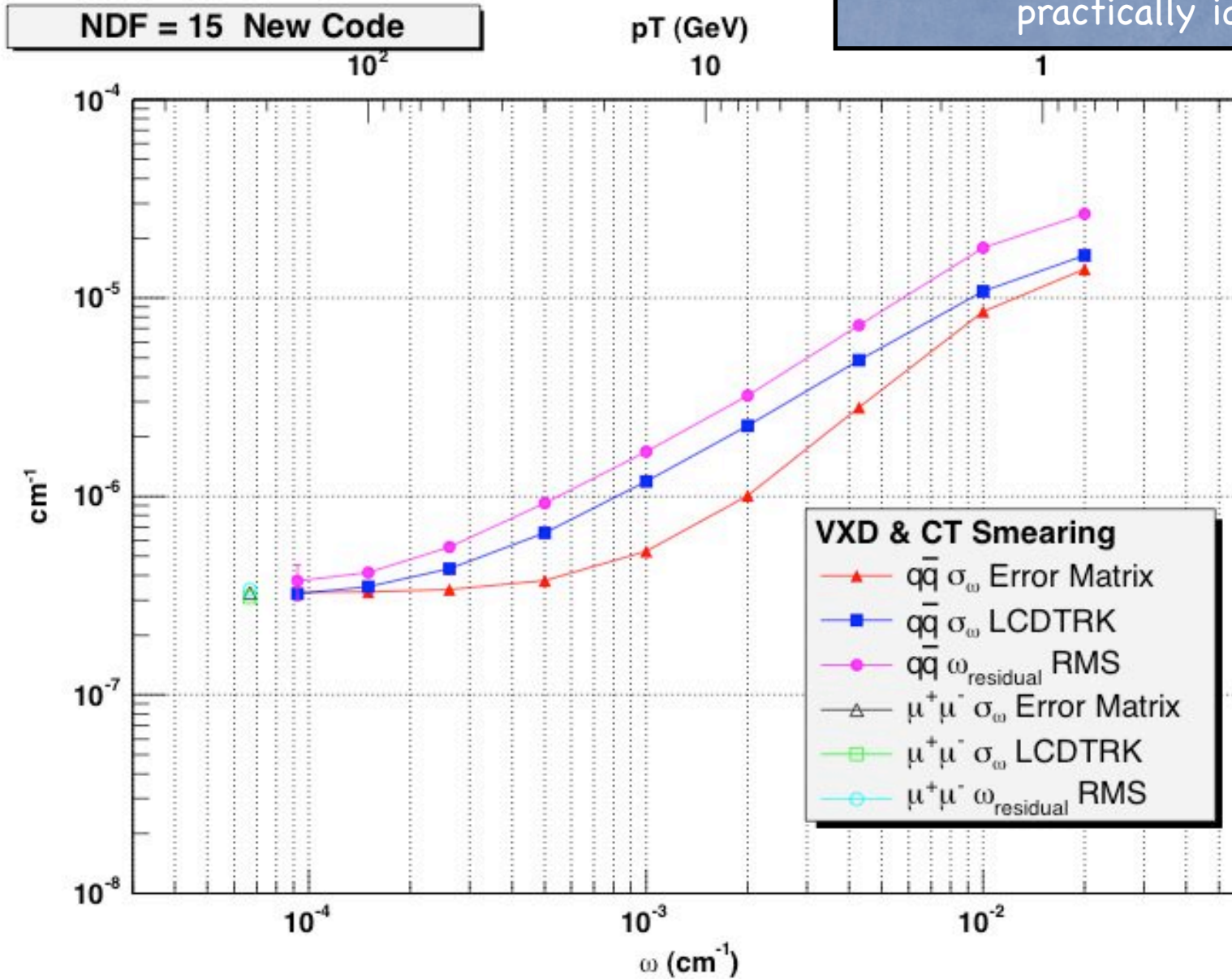
Efficiency vs. pT^{-1}



Efficiency vs. pT^{-1}



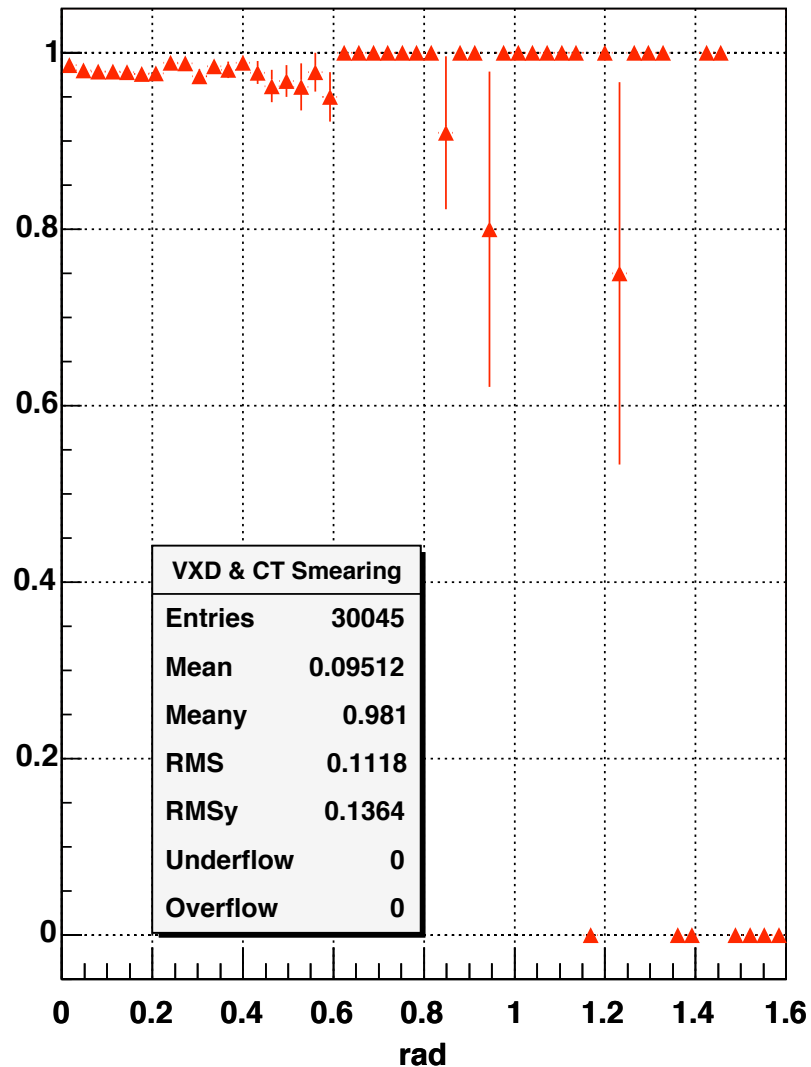
ω resolution: Gaussian smearing only
CCD and CT smearing looks practically identical.



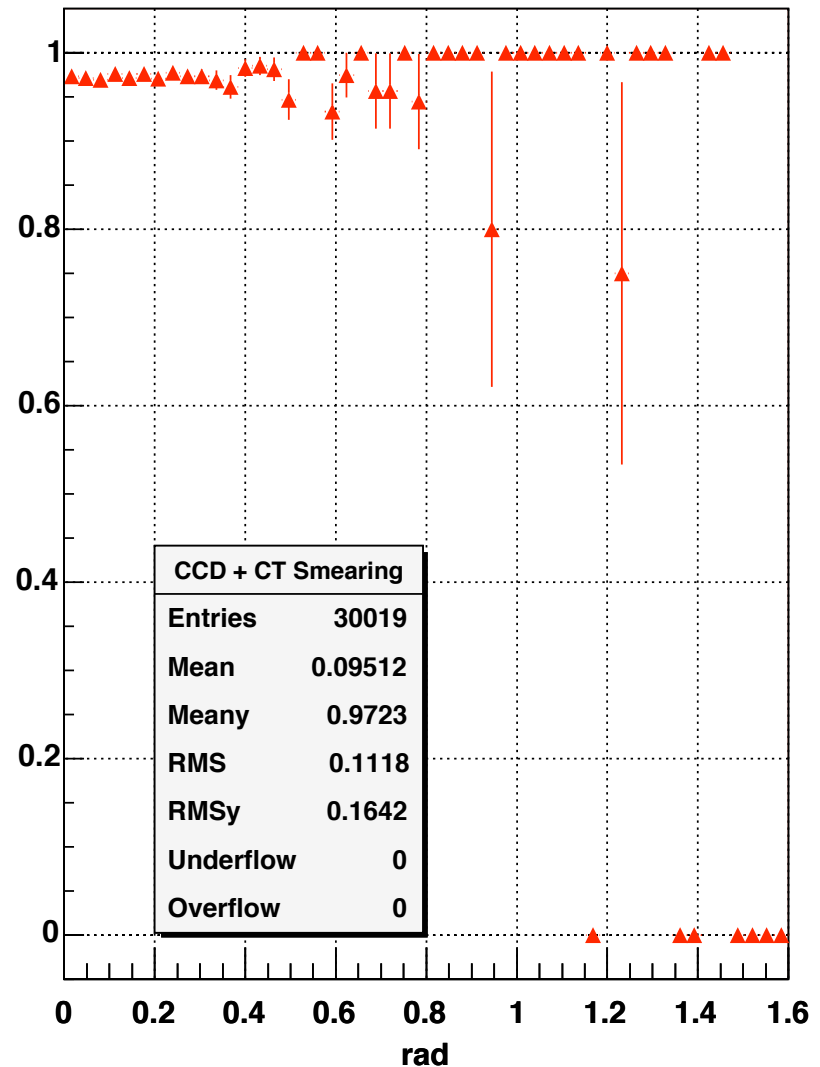
And now add in the fitter routine fixes...

qq-bar Efficiency

Efficiency vs. Abs(α)

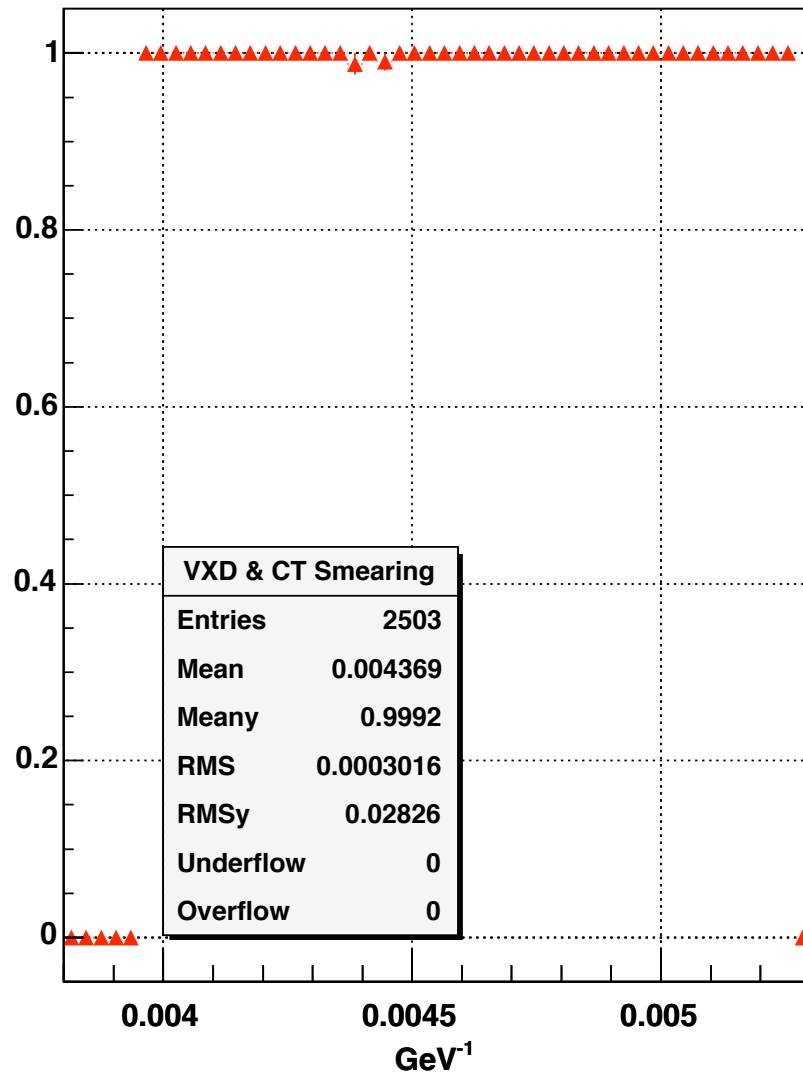


Efficiency vs. Abs(α)

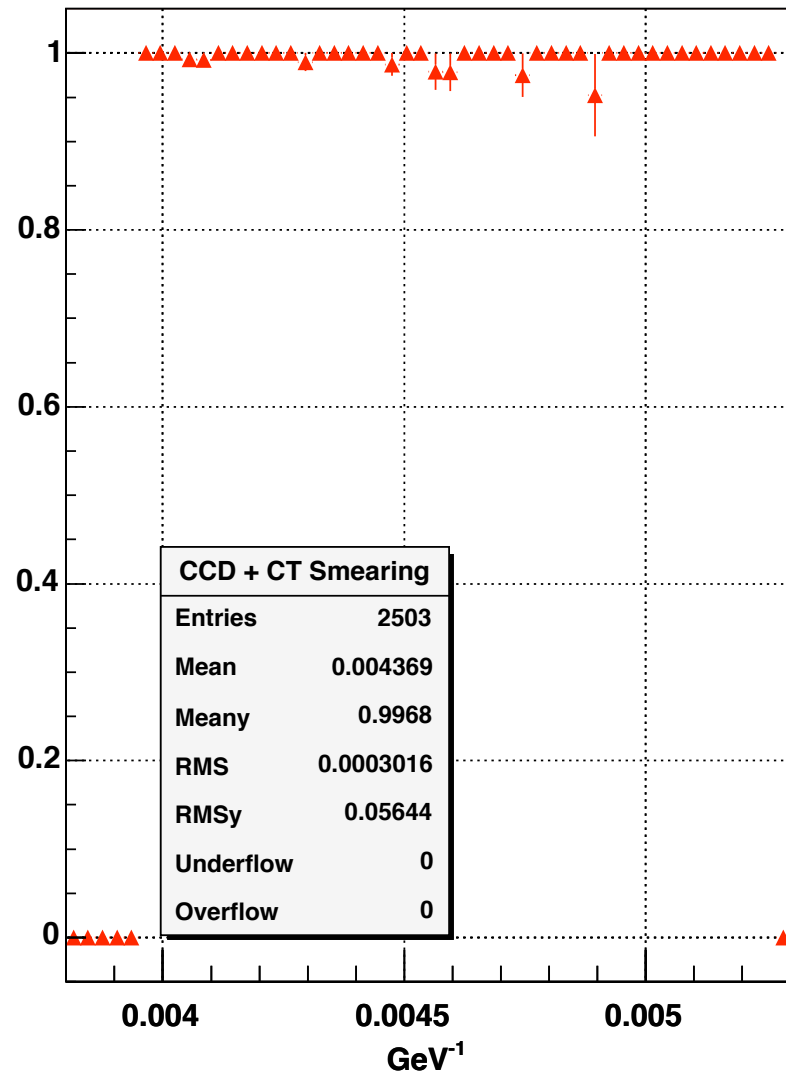


$\mu\mu$ Efficiency

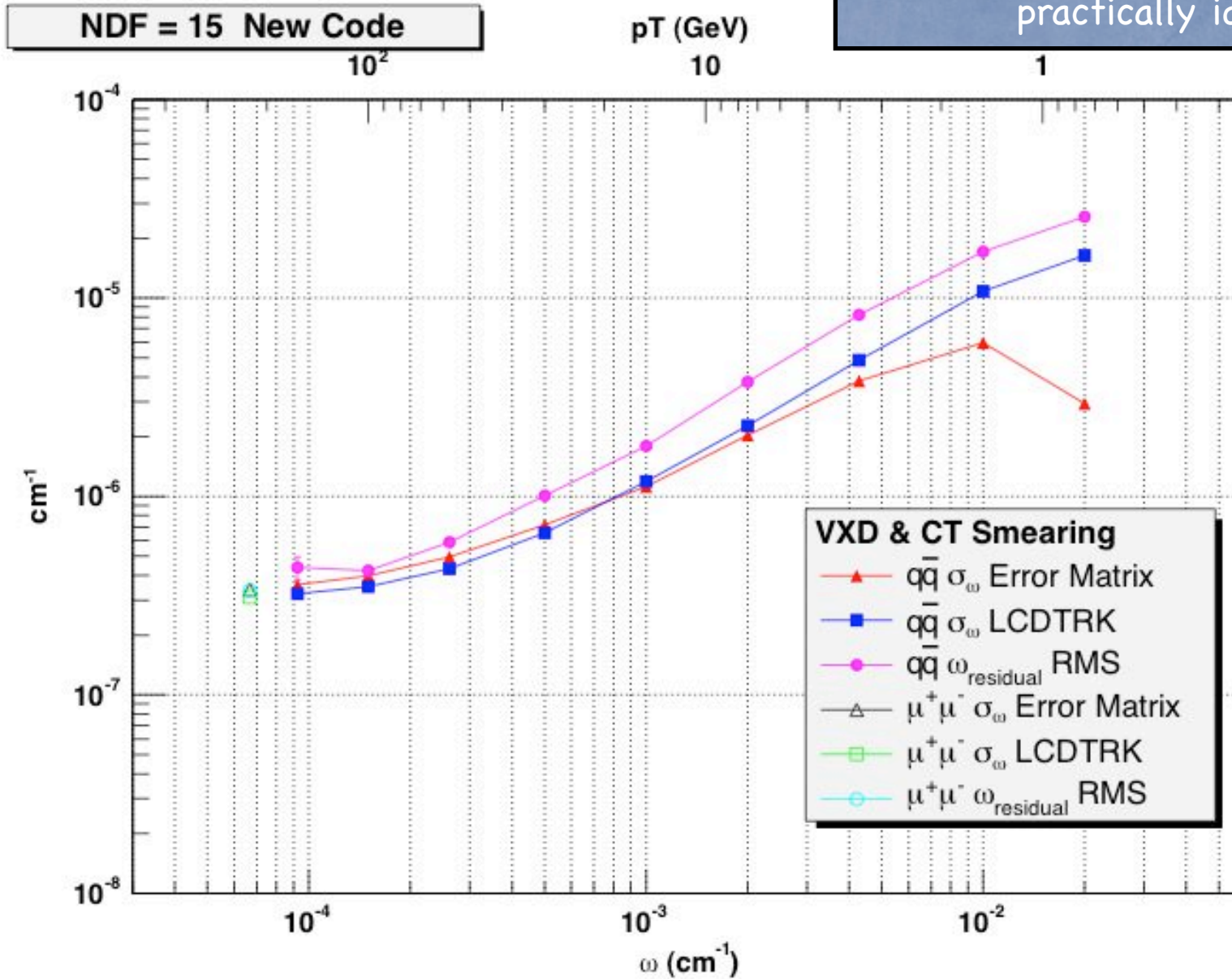
Efficiency vs. pT^{-1}



Efficiency vs. pT^{-1}



ω resolution: Gaussian smearing only
CCD and CT smearing looks practically identical.



And now a close look at muon bin values...

Muon Bin curvature values

LCDTRK = 3.116e-07

Old code (smear only):	residual = 3.331e-07	error matrix = 3.264e-07
Old code (CCD+smear):	residual = 3.248e-07	error matrix = 3.264e-07
+Pattern Fixes (smear only):	residual = 3.396e-07	error matrix = 3.264e-07
+Pattern Fixes (CCD+smear):	residual = 3.289e-07	error matrix = 3.264e-07
+Fitter Fixes (smear only):	residual = 3.386e-07	error matrix = 3.396e-07
+Fitter Fixes (CCD+smear):	residual = 3.219e-07	error matrix = 3.396e-07

And a final note about the fitter changes...

Efficiency vs. pT^{-1}

rOrgMax: 1

