SiliMap Status

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Outline

- Code Status
- Usage
- New Validation:
  - timings
  - single μ MC
  - $D^* \to \pi_s D^0$, $D^0 \to K\,\pi$

Code Status

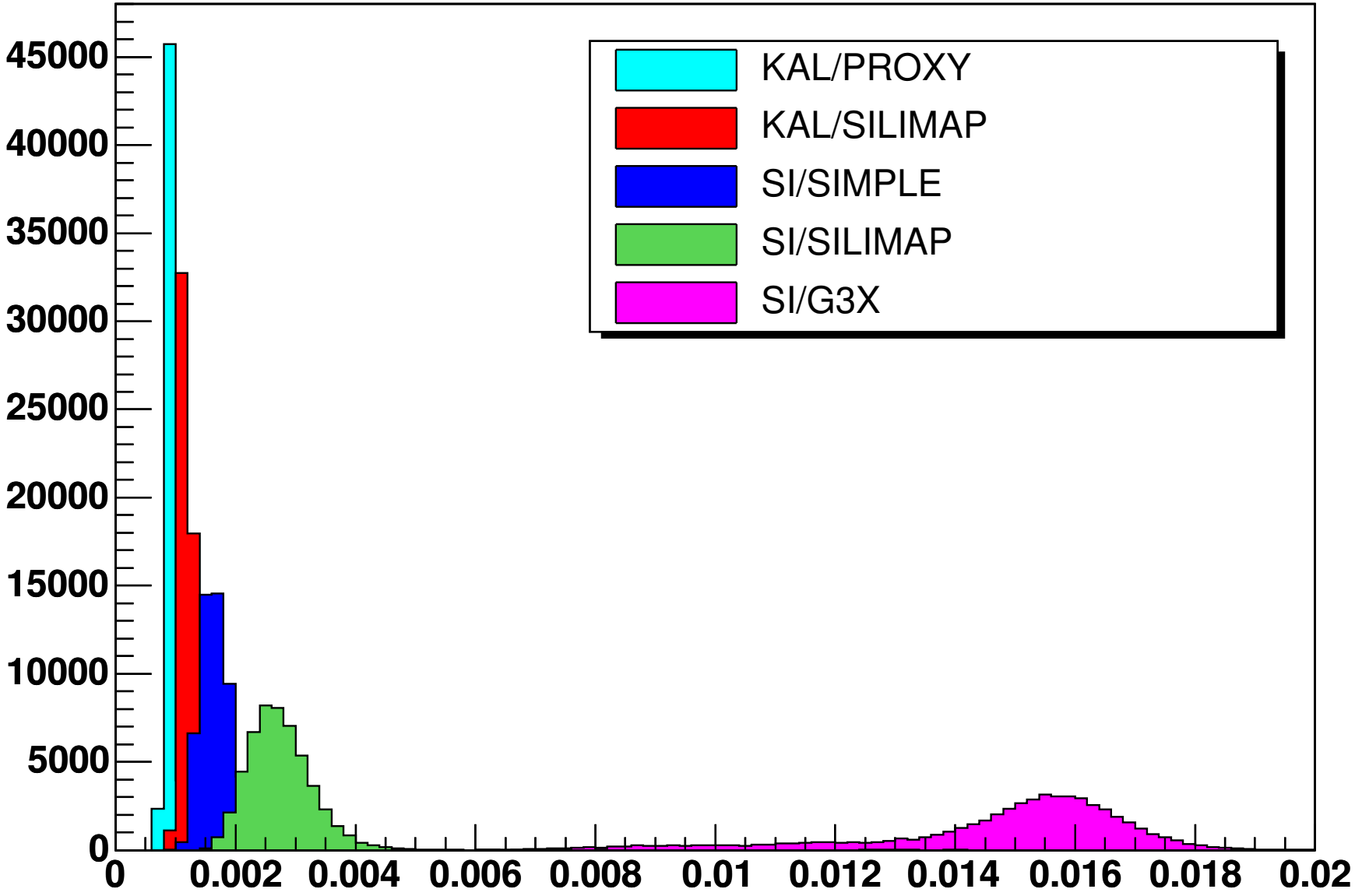
- **`SiliMapScanMod`** updated for easy map generation:
  - **`addpkg TrackingUserMods`**
  - **`gmake nobin tbin SILIMAPSCAN=yes`**
  - **`siliMapScan ./TrackingUserMods/test/silimap_caf_job.tcl`**
  - **`./caf_submit_scan`**
  - copy results to **`silimap_construction_site/`** and run **`assemble_map`**
- silimap v5_3_1 now shipped with development
- **`SiliconGeometryMenu`**
  - adapted to product directory structure
  - chooses correct map based on **`CreatePhantomLayer`** switch

Usage

- Usage now easier than ever:
  - **`setup silimap v5_3_1`**
  - **`ReadSiliMapROOT set t`**
  - KAL fitter: **`F_KAL`** and **`KalConverter::useSiliMap(true)`** (before the first **`TrackRefitter`** is constructed!)
  - SI fitter: use **`F_SIMAP`**
- First draft of documentation available: CDF/DOC/BOTTOM/PUBLIC/5846

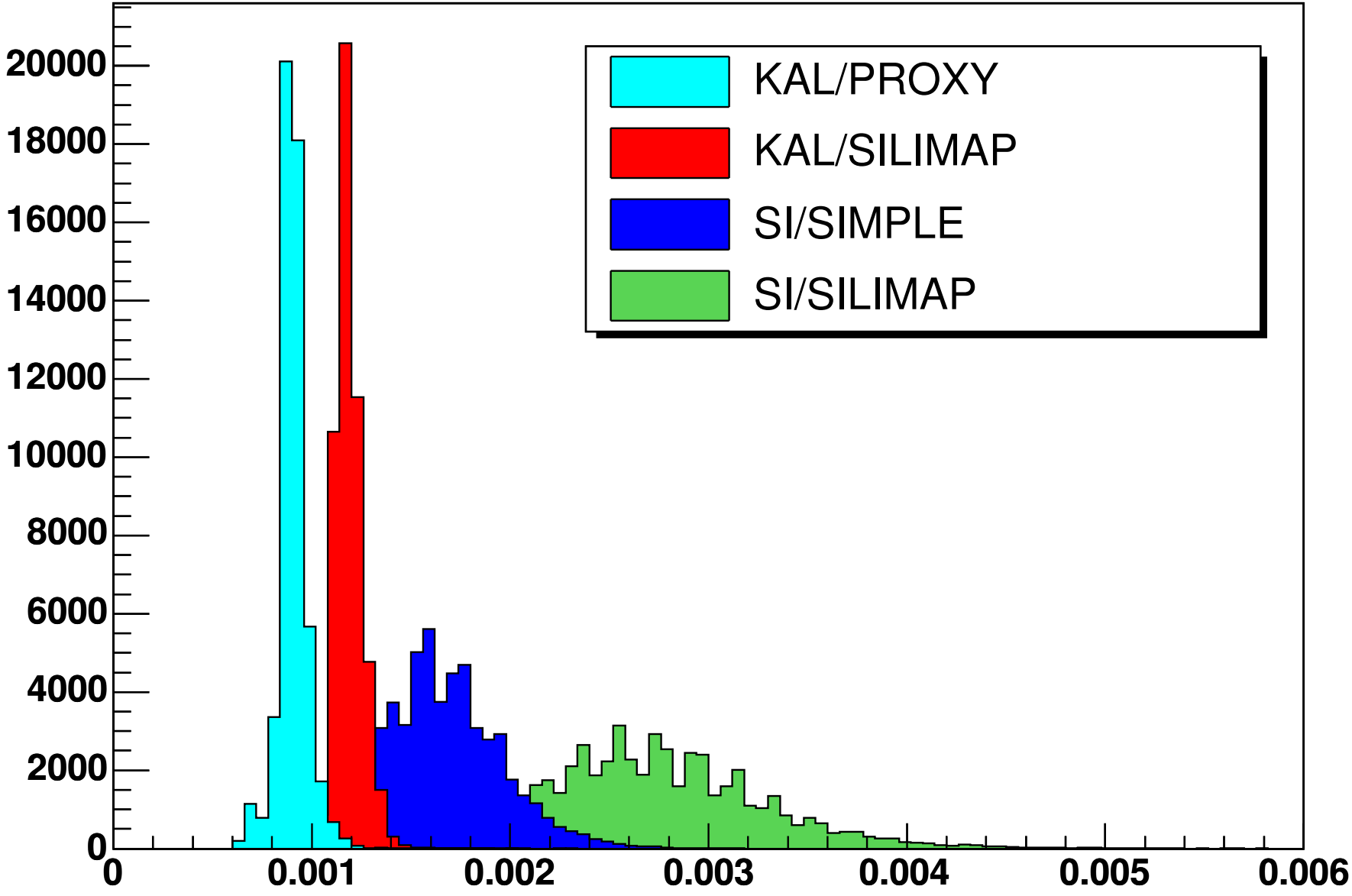
Timing Performance – all

Time per track fit, measured with **`ZMtimer`** on AMD Opteron 240



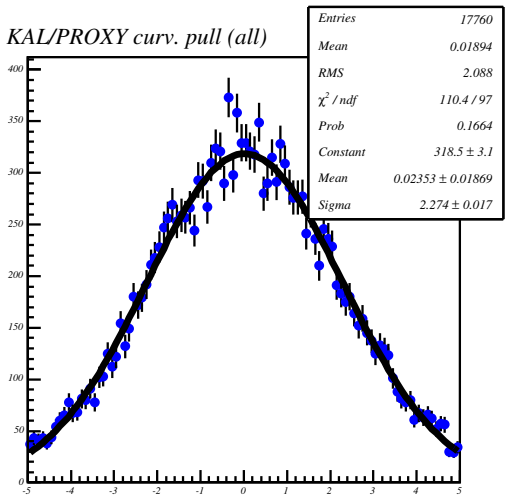
Timing Performance – fast only

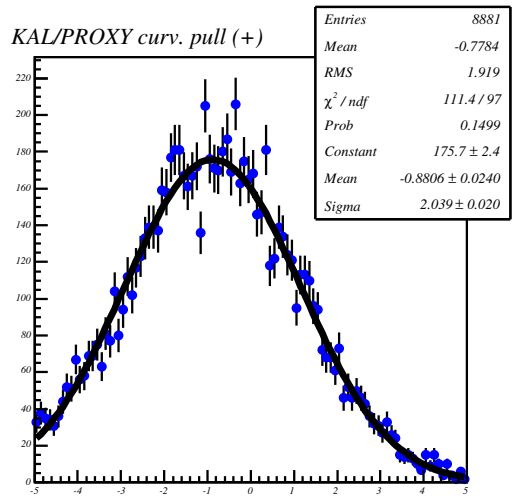
Time per track fit, measured with **`ZMtimer`** on AMD Opteron 240

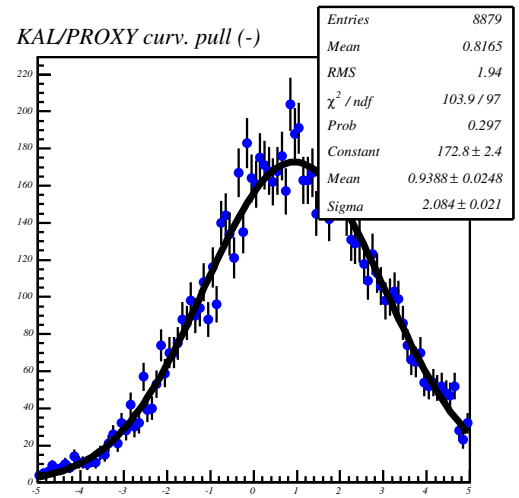


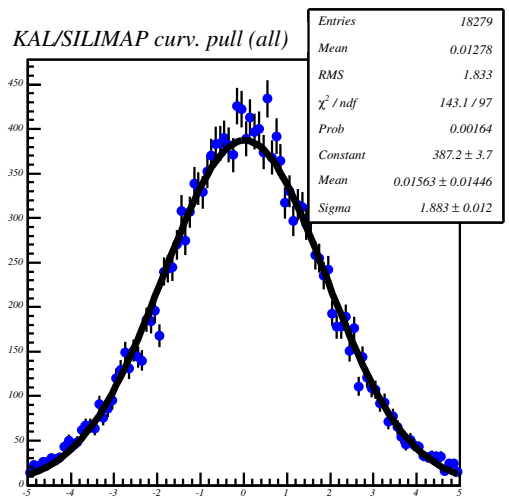
Curvature Pull: Proxy vs. SiliMap

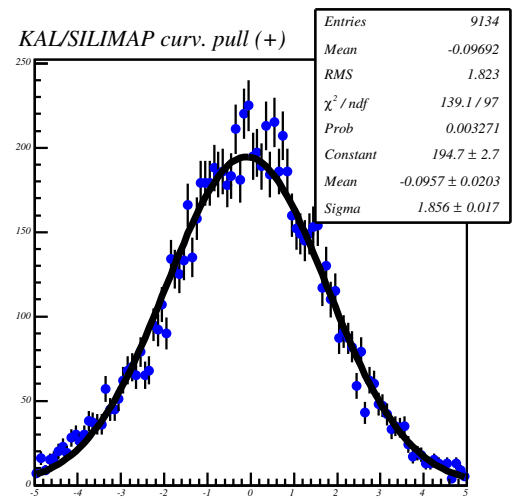
Single μ MC with $|\eta| < 1, p \in [0.5, 2]$ GeV, 5.3.1int1, OI Tracks

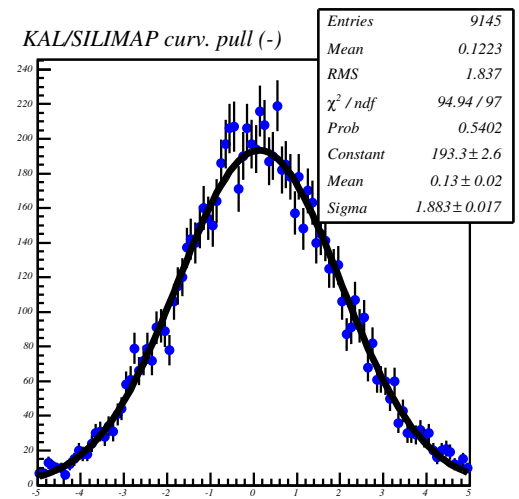






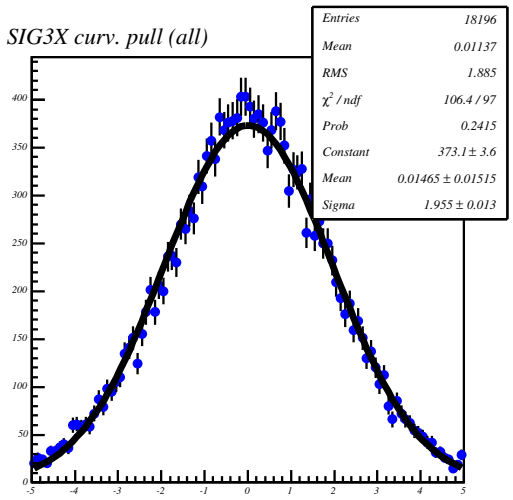


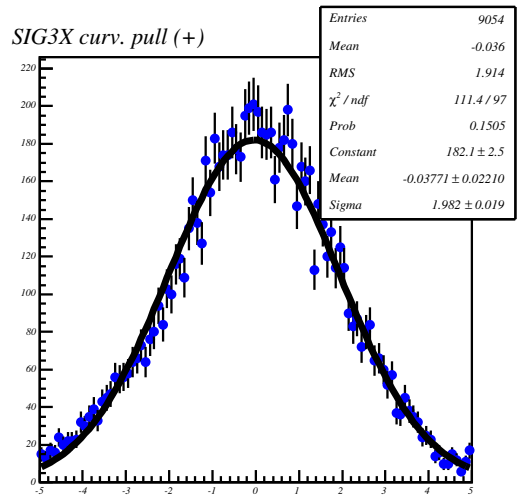


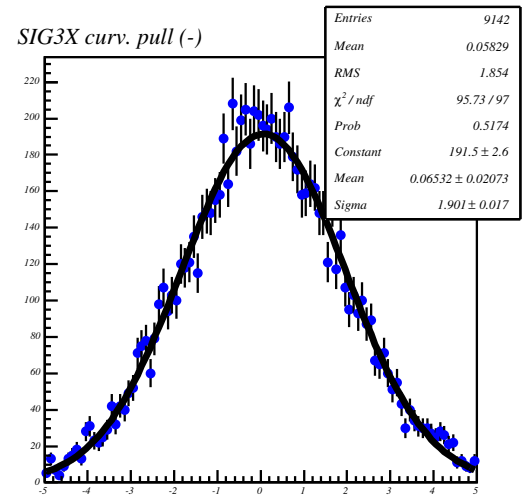


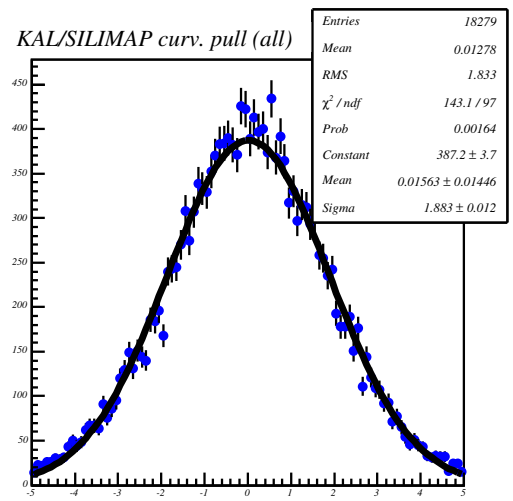
Curvature Pull: G3X vs. SiliMap

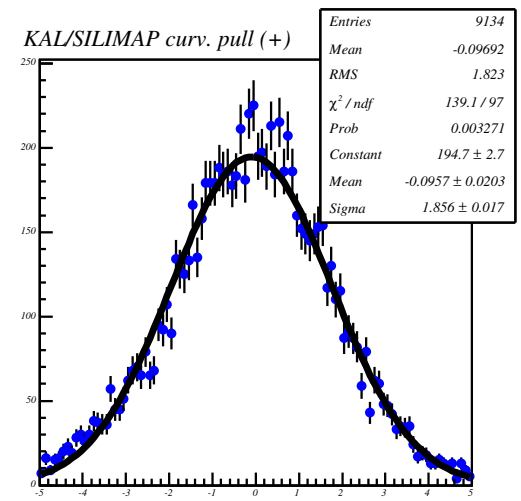
Single μ MC with $|\eta| < 1, p \in [0.5, 2]$ GeV, 5.3.1int1, OI Tracks

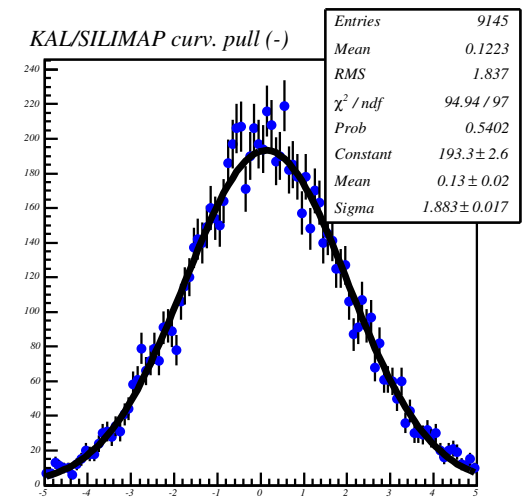






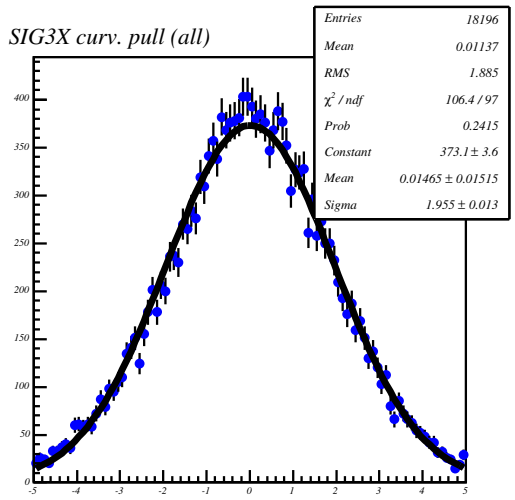


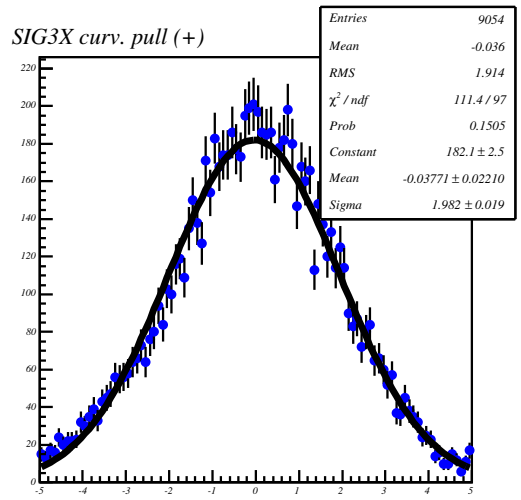


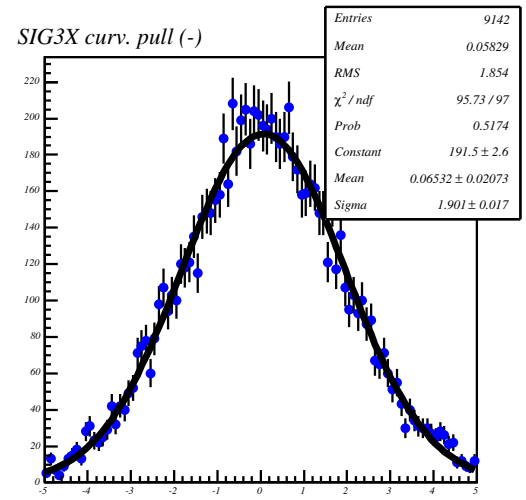


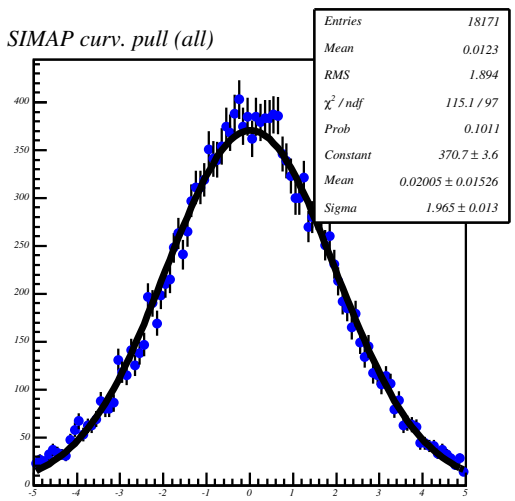
Curvature Pull: G3X vs. F_SIMAP

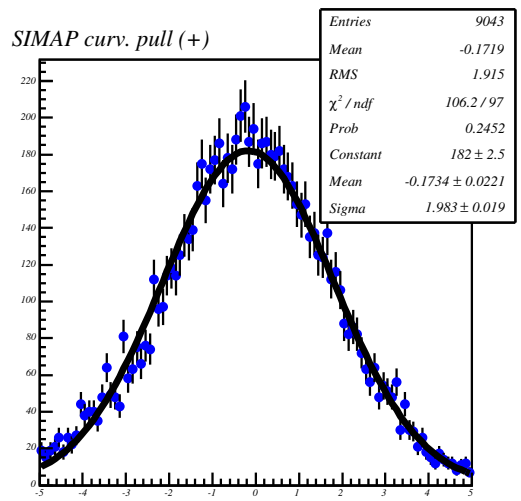
Single μ MC with $|\eta| < 1, p \in [0.5, 2]$ GeV, 5.3.1int1, OI Tracks

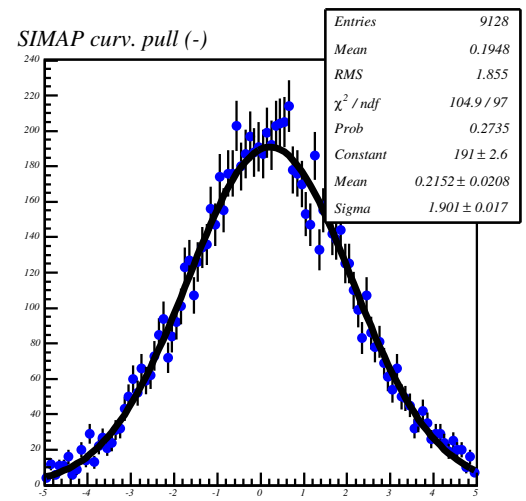






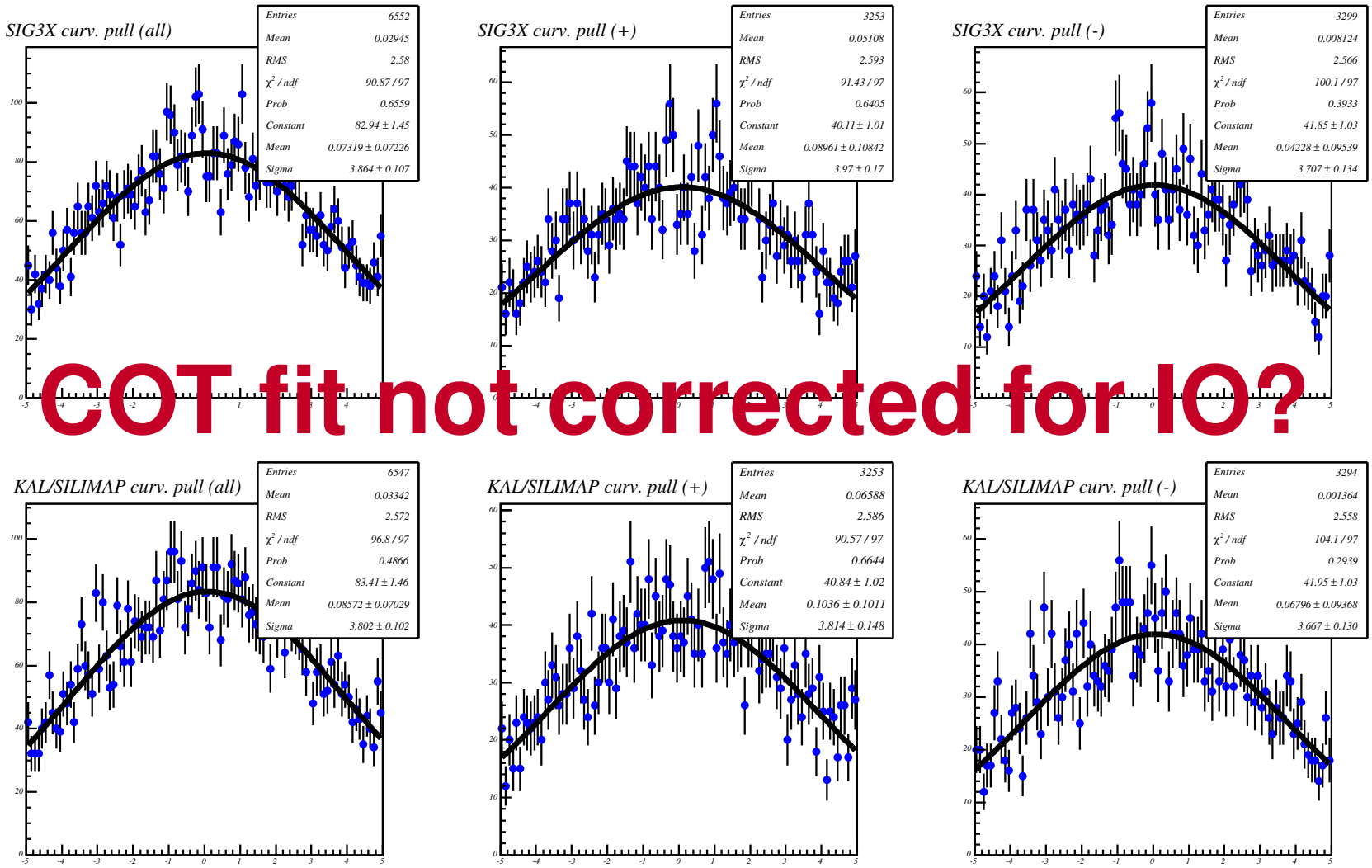






IO Track Refits

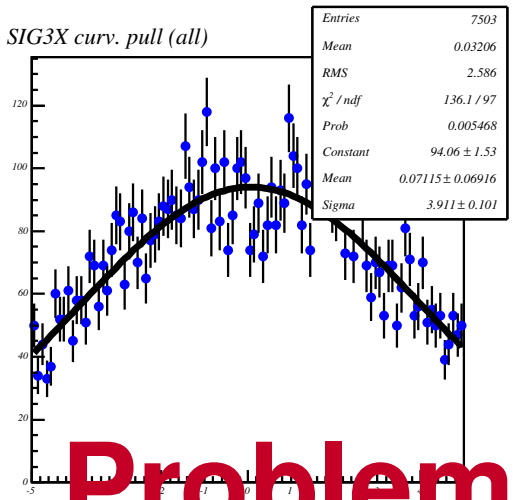
Single μ MC with $|\eta| < 1, p \in [2, 10]$ GeV, 5.3.1int1, IO Tracks

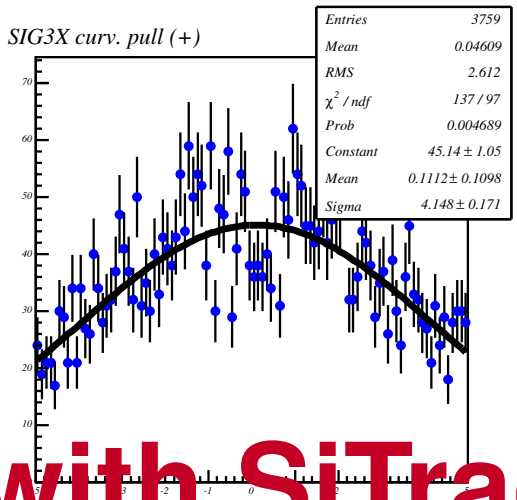


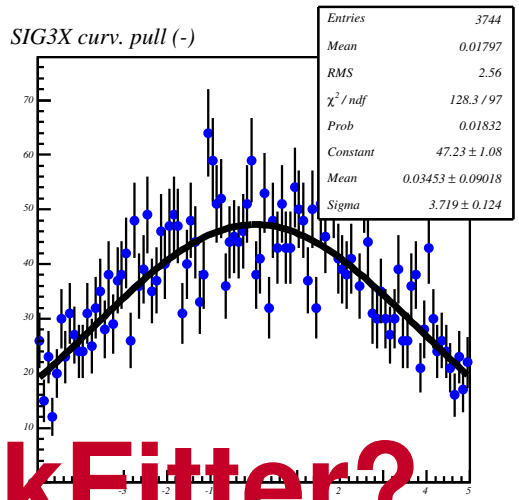
COT fit not corrected for IO?

SA Track Refits

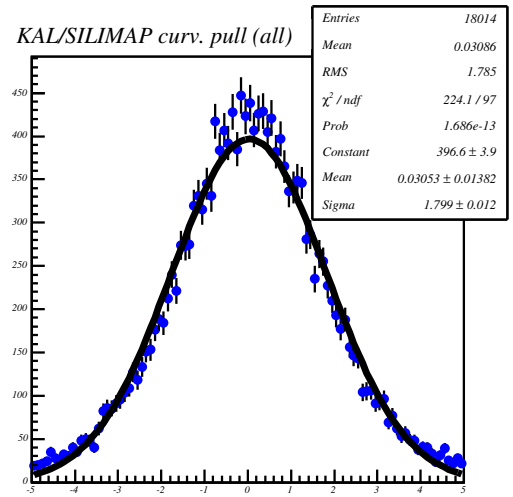
Single μ MC with $|\eta| < 1, p \in [2, 10]$ GeV, 5.3.1int1, SA Tracks

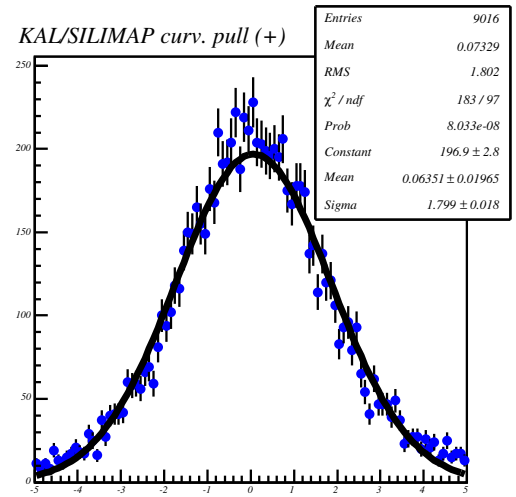


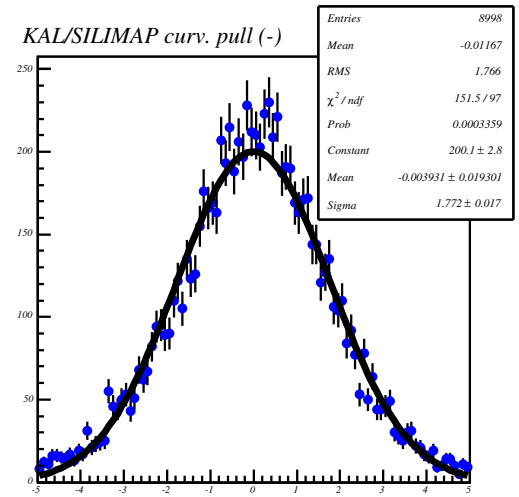




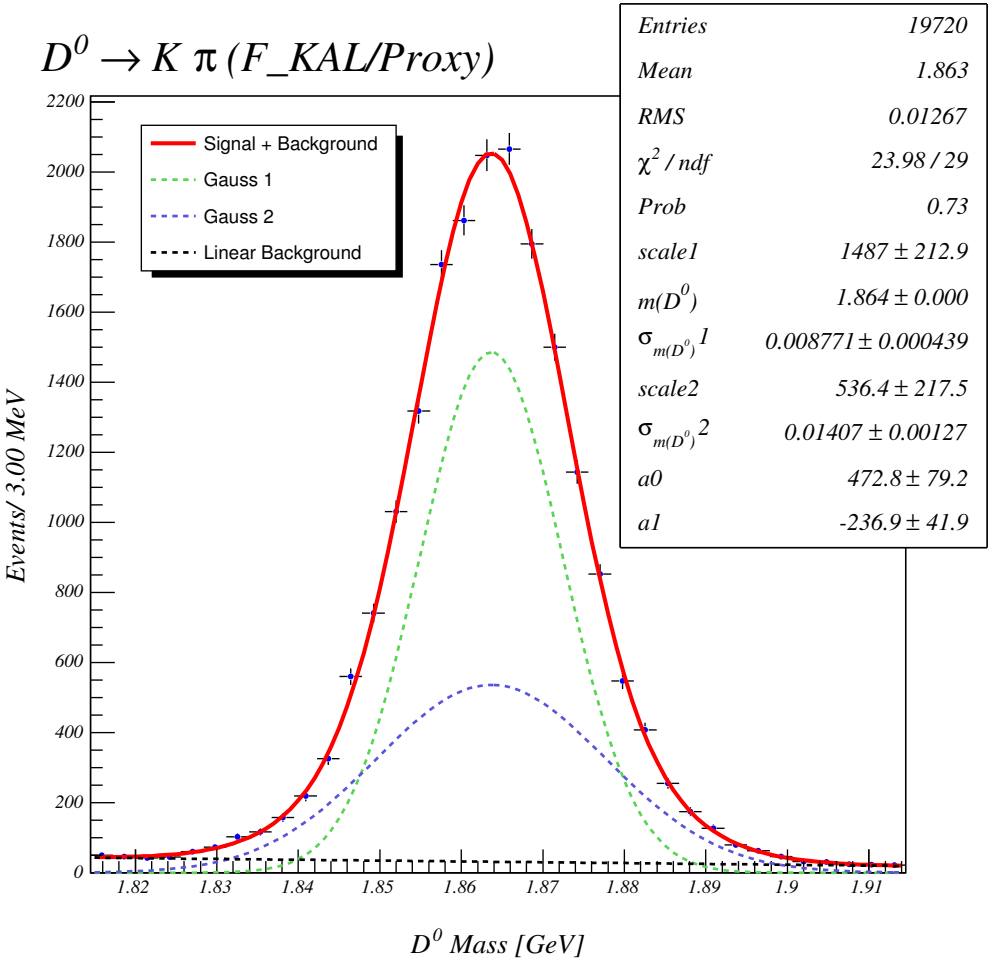
Problem with SiTrackFitter?



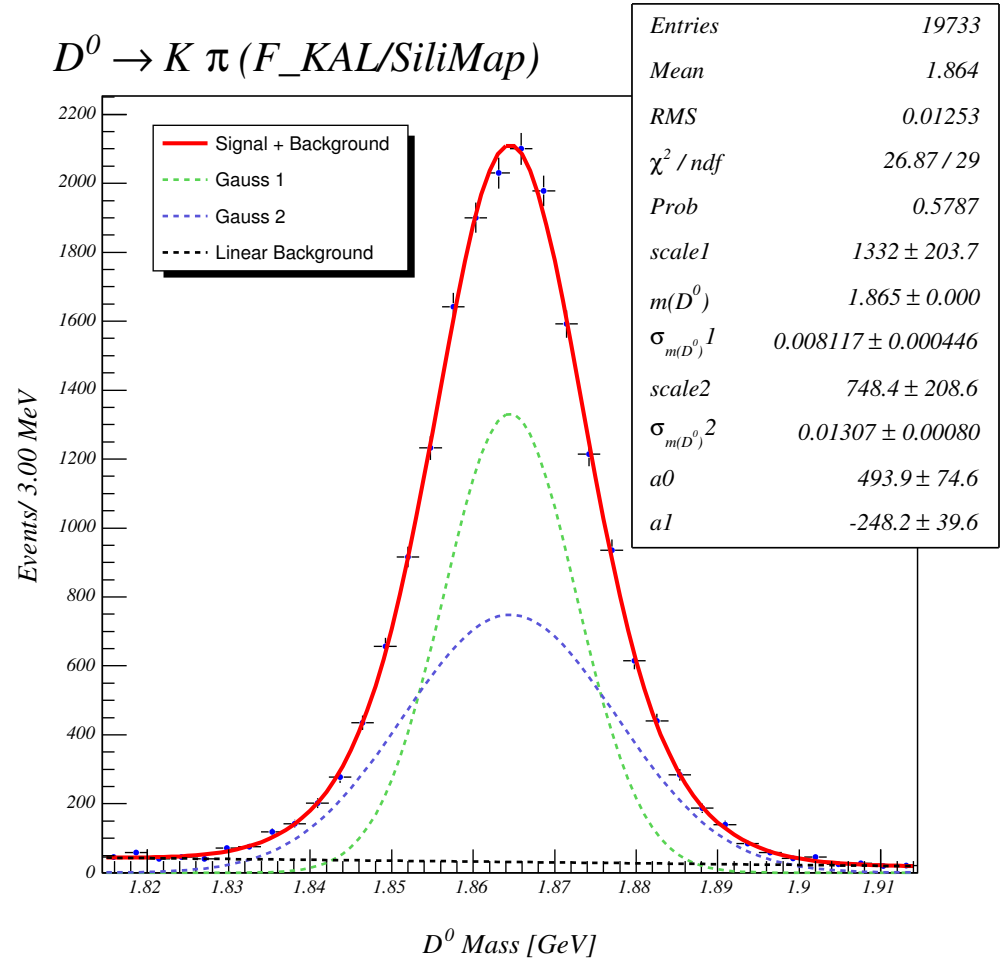




$D^0 \to K\,\pi$ mass, Proxy vs. SiliMap

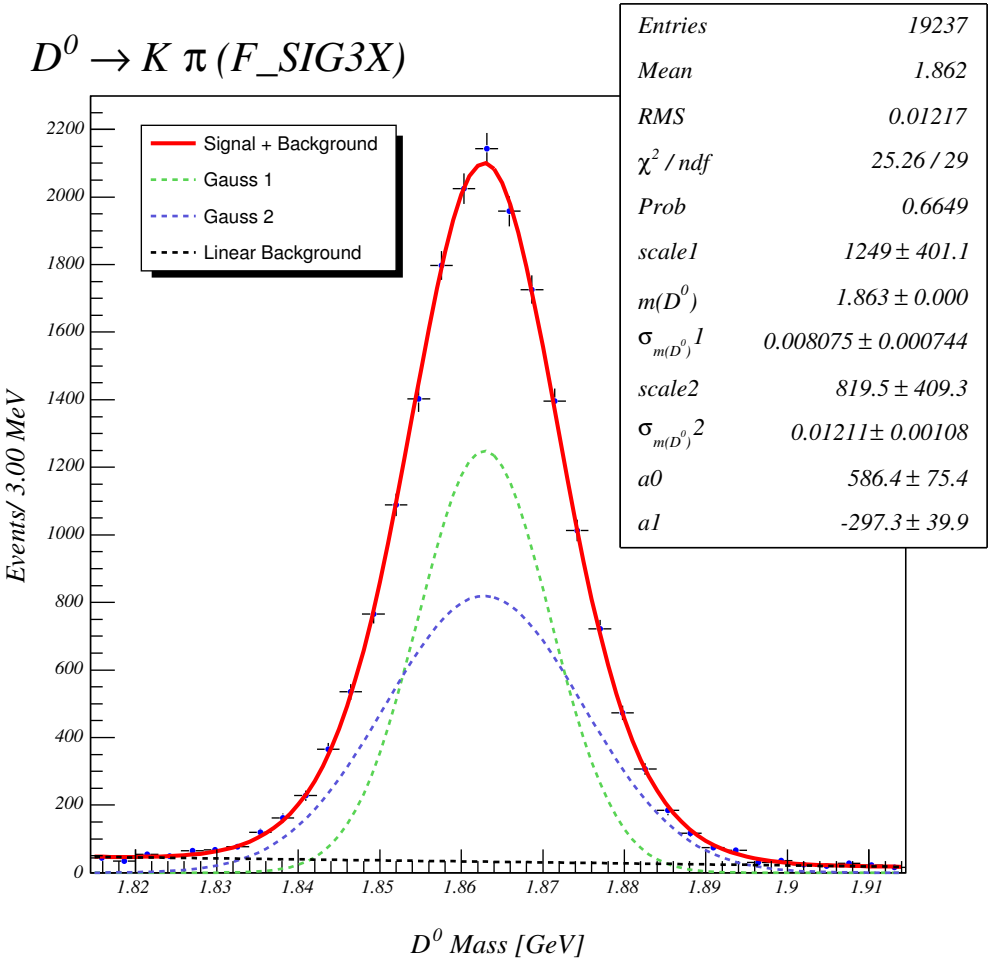


m = 1.86366 ± 8.498e-05 GeV

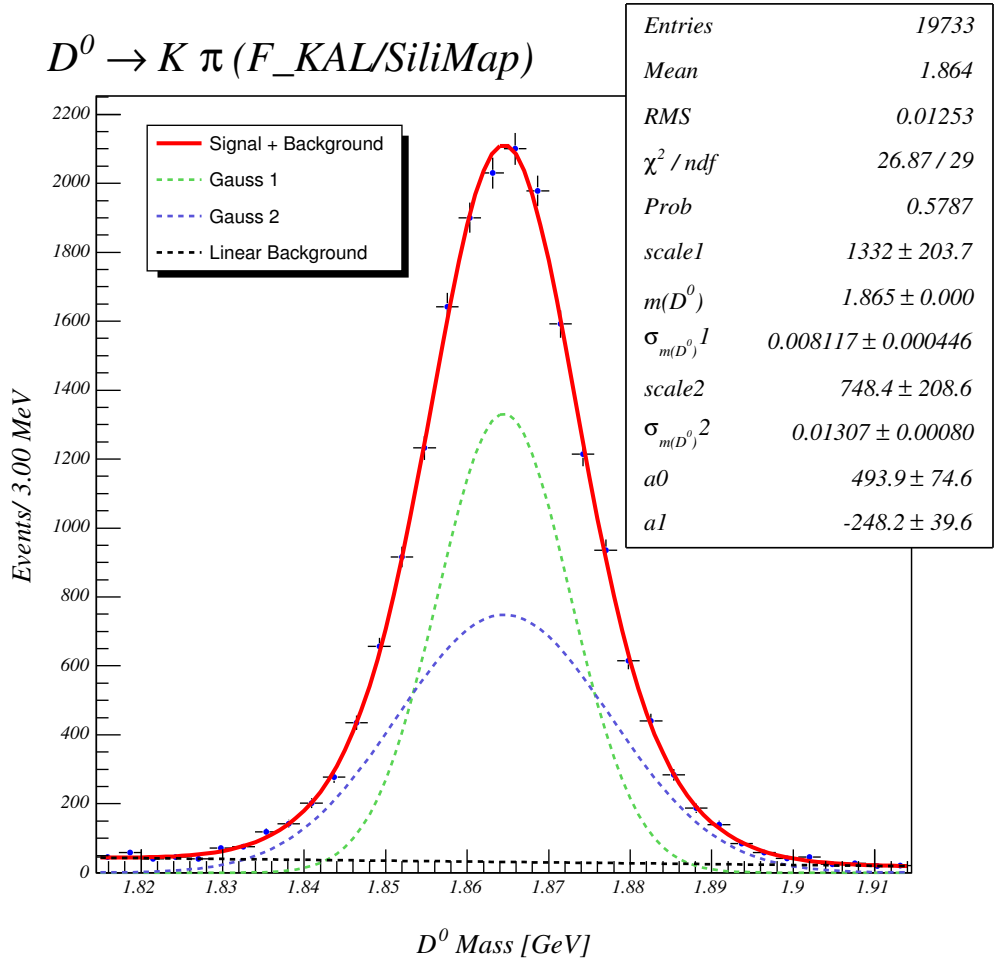


m = 1.86451 ± 8.032e-05 GeV

$D^0 \to K\,\pi$ mass, G3X vs. SiliMap



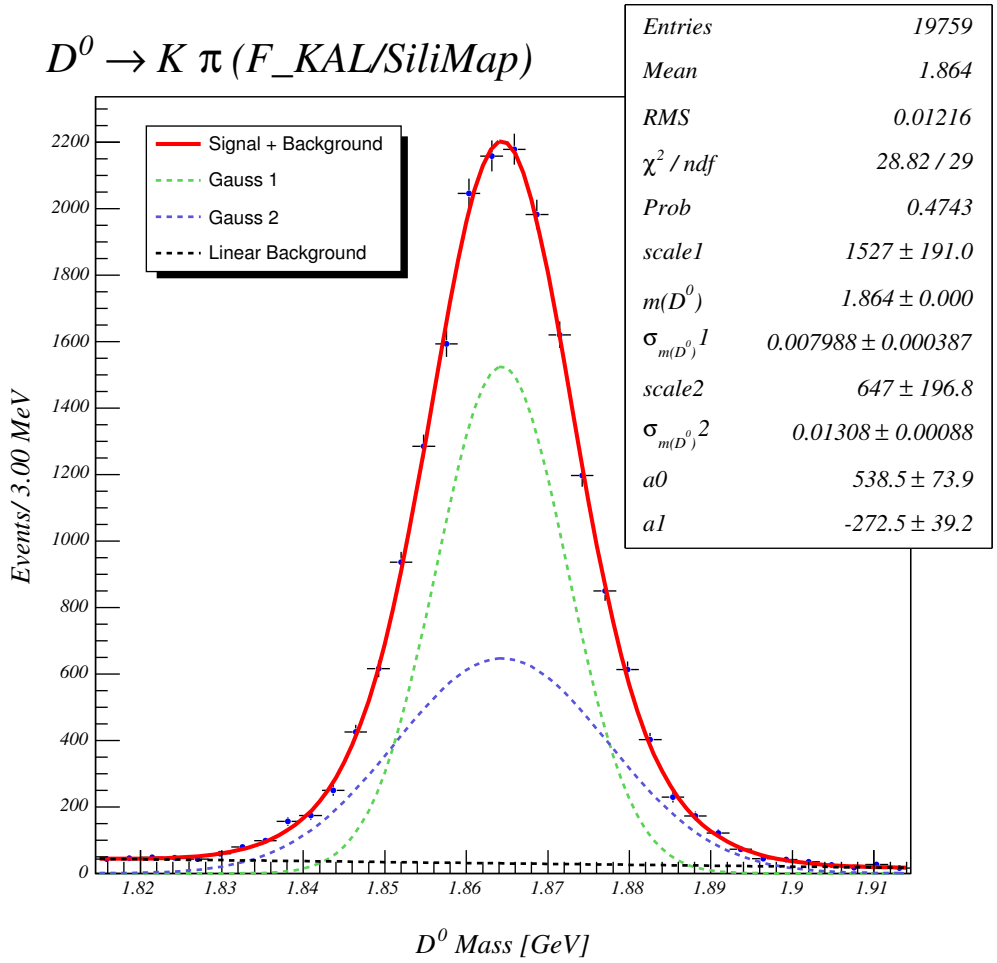
m = 1.86280 ± 8.107e-05 GeV



m = 1.86451 ± 8.032e-05 GeV

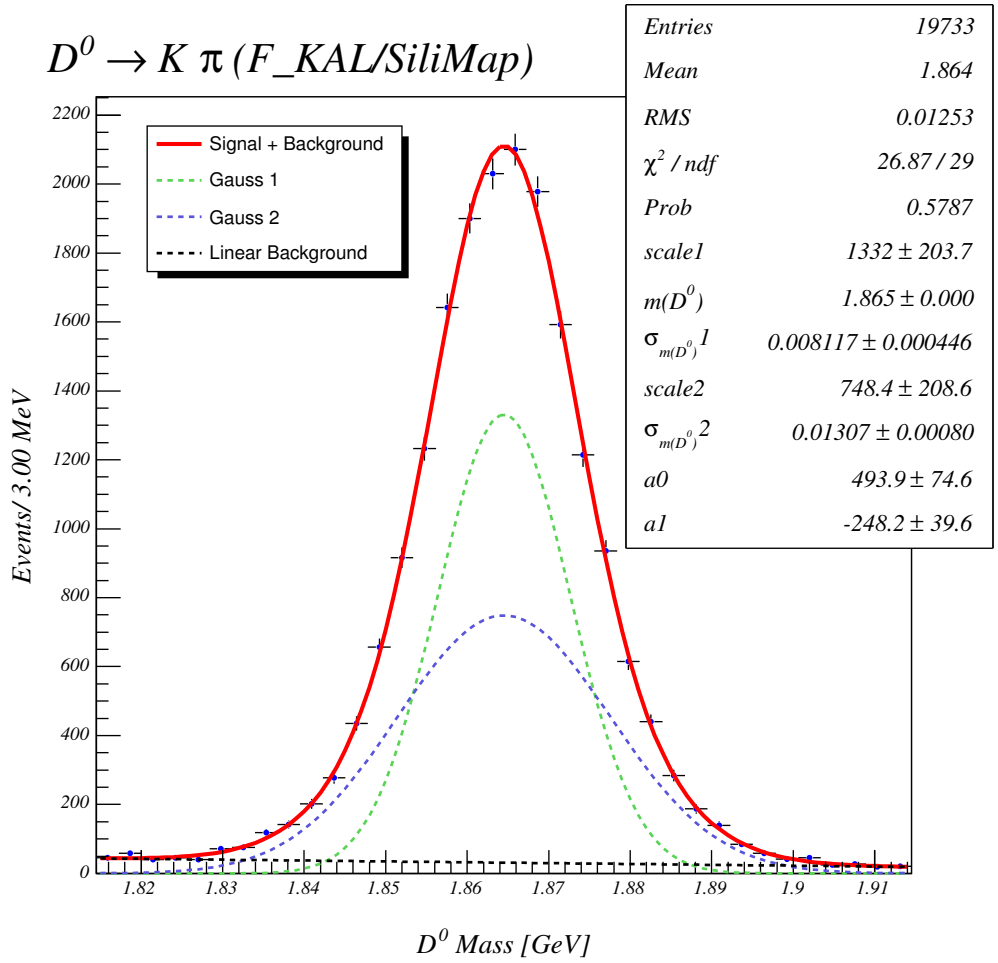
$D^0 \to K\,\pi$ mass, with vs. w/o COT corr.

w/o corr.



m = 1.86435 ± 7.883e-05 GeV

with corr.



m = 1.86451 ± 8.032e-05 GeV

$D^0 \to K\,\pi$ Summary

- if G3X is ideal, SiliMap over-estimates
- width grows when COT corrections are applied
  - KAL fitter is more affected than SI fitter
  - is this significant?
- D^0 mass with KAL + SiliMap + COT corrections sits right on PDG

Remaining Issues

- validation on $J/\psi \rightarrow \mu\mu \Rightarrow$ Ashutosh
  (I have also jobs running...)
- complete documentation
- change default for fitting