



Single-particle MC

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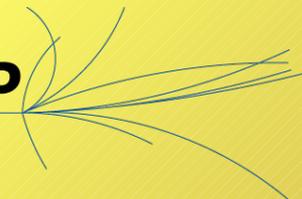
What is this?

- trackOnePartMC is meant to do an idealized Monte Carlo of DC1-PWC6 response
- It uses ROOT virtual MC classes to interface to GEANT 3.21
 - All physics processes except hadronic interactions and decay are on without generation of secondaries
- It test performance of the template fitter with perfect pattern recognition (creating TrkCand's)



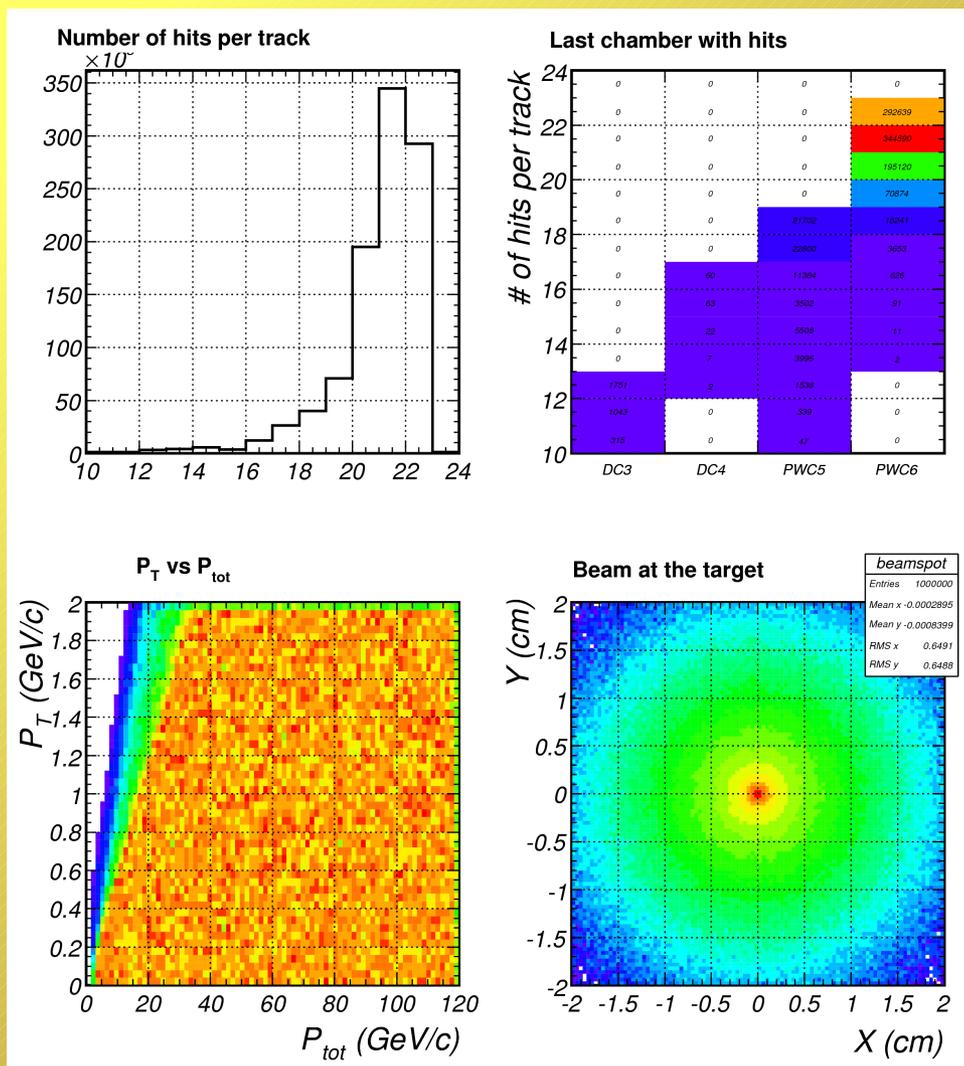
Monte Carlo Settings

- Requires particle to get through Rosie without touching steel
- Assumes 95% chamber efficiency
 - Too good, but ok for a starting point
- Takes into account geometry chamber rotations in xz and yz



What are these 10^6 tracks?

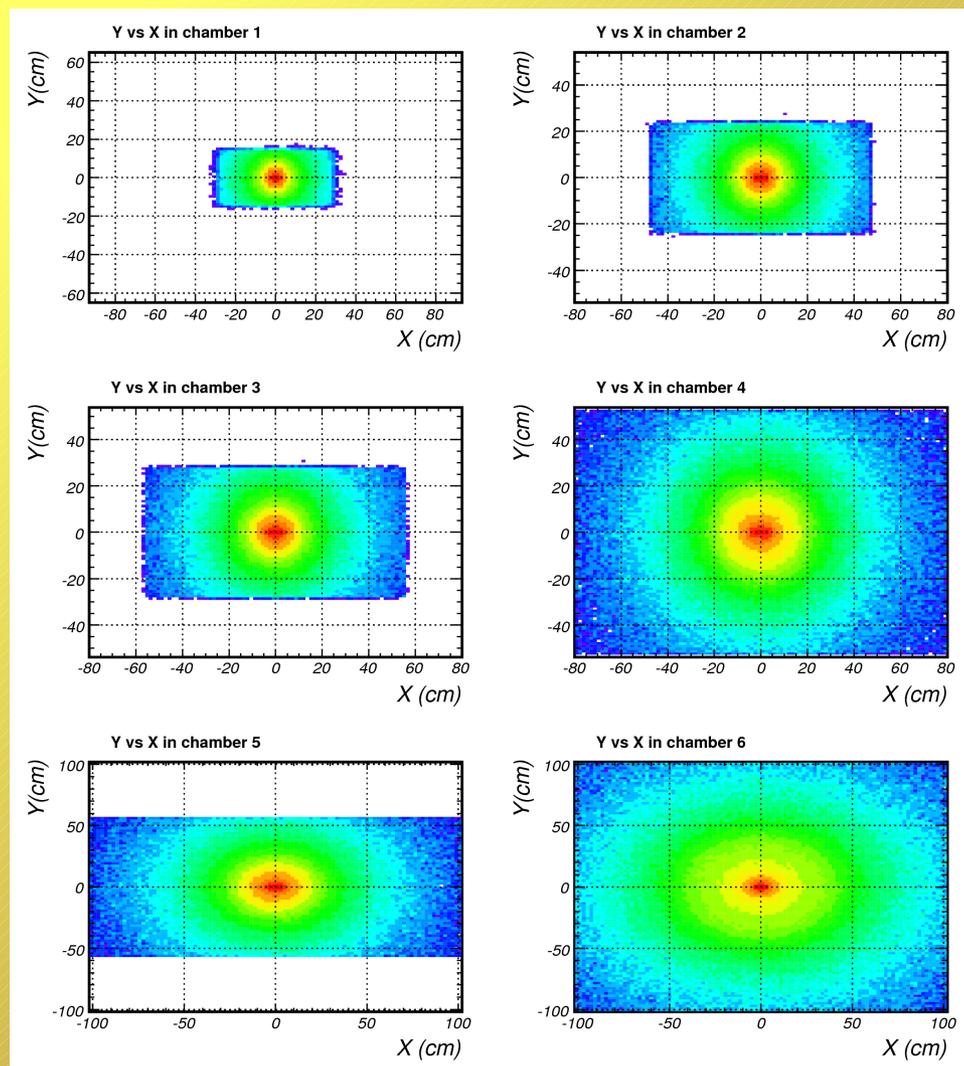
- These tracks are intentionally **not** representative of the particle flux at MIPP in terms of the phase space they probe
- Beam spot is large enough to avoid aliasing





Sampled Chamber Area

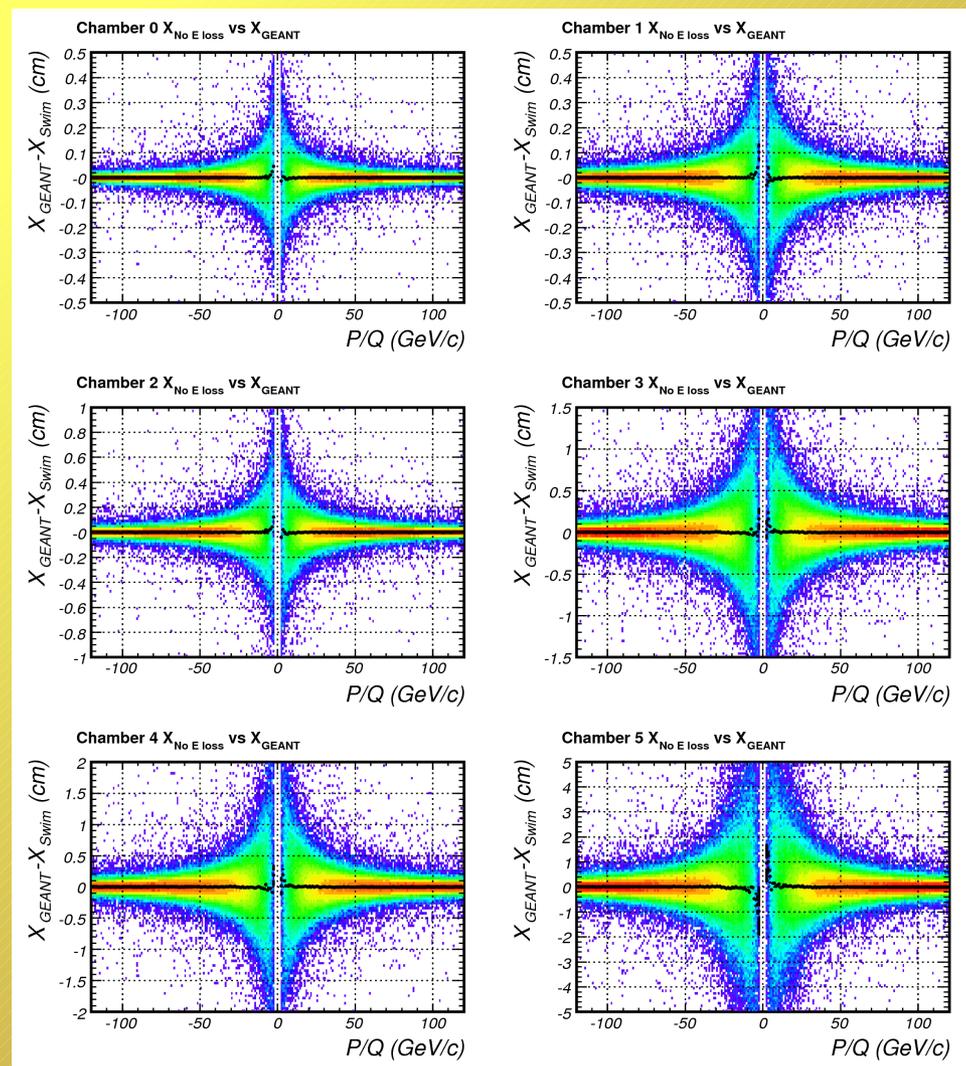
- The axis limits on these plots represent approximate chamber sizes
- A relatively small spot of DC1 is probed
- PWC5 is clipped in the vertical by Rosie





No E-loss Swimmer

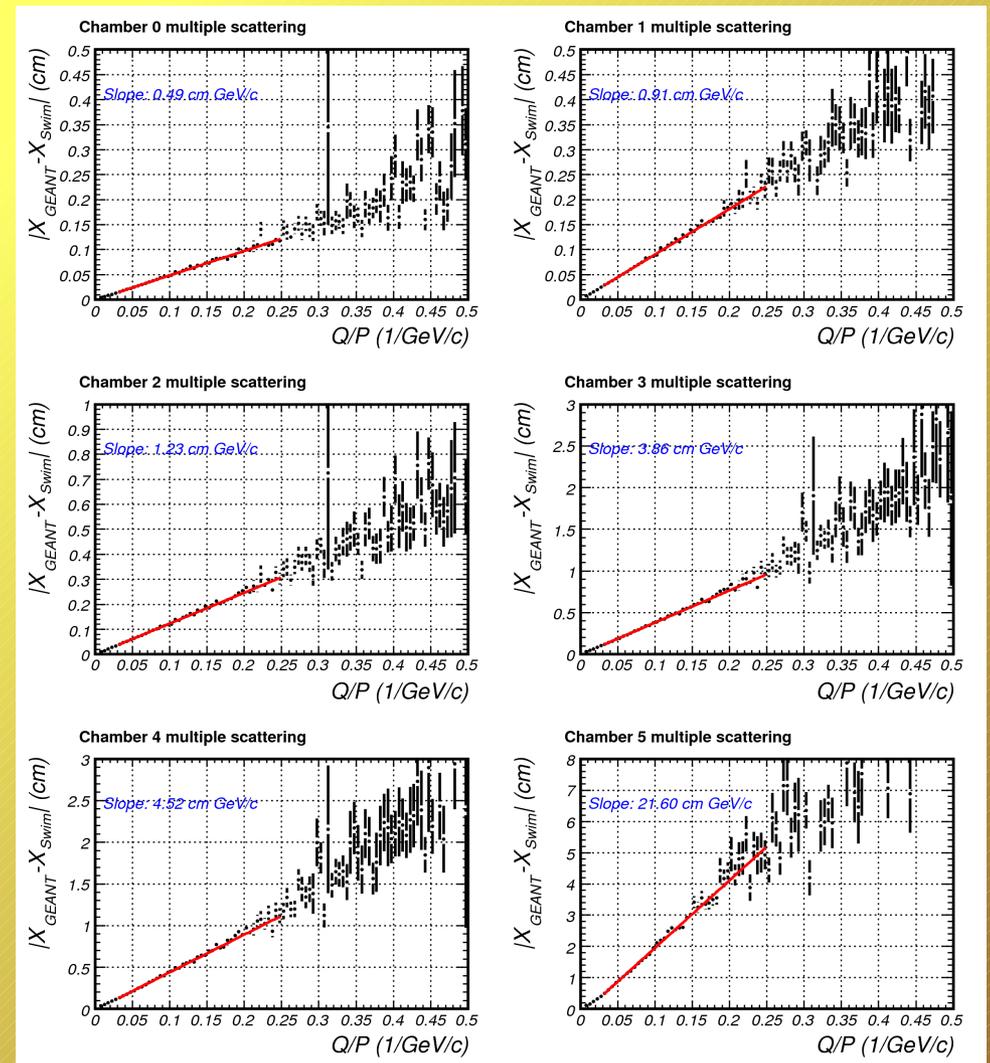
- A natural question is whether our swimmer agrees with GEANT
 - It should, cause it's a rewritten GEANT swimmer
- On average, I do not see any problems





Multiple-Scattering Contribution

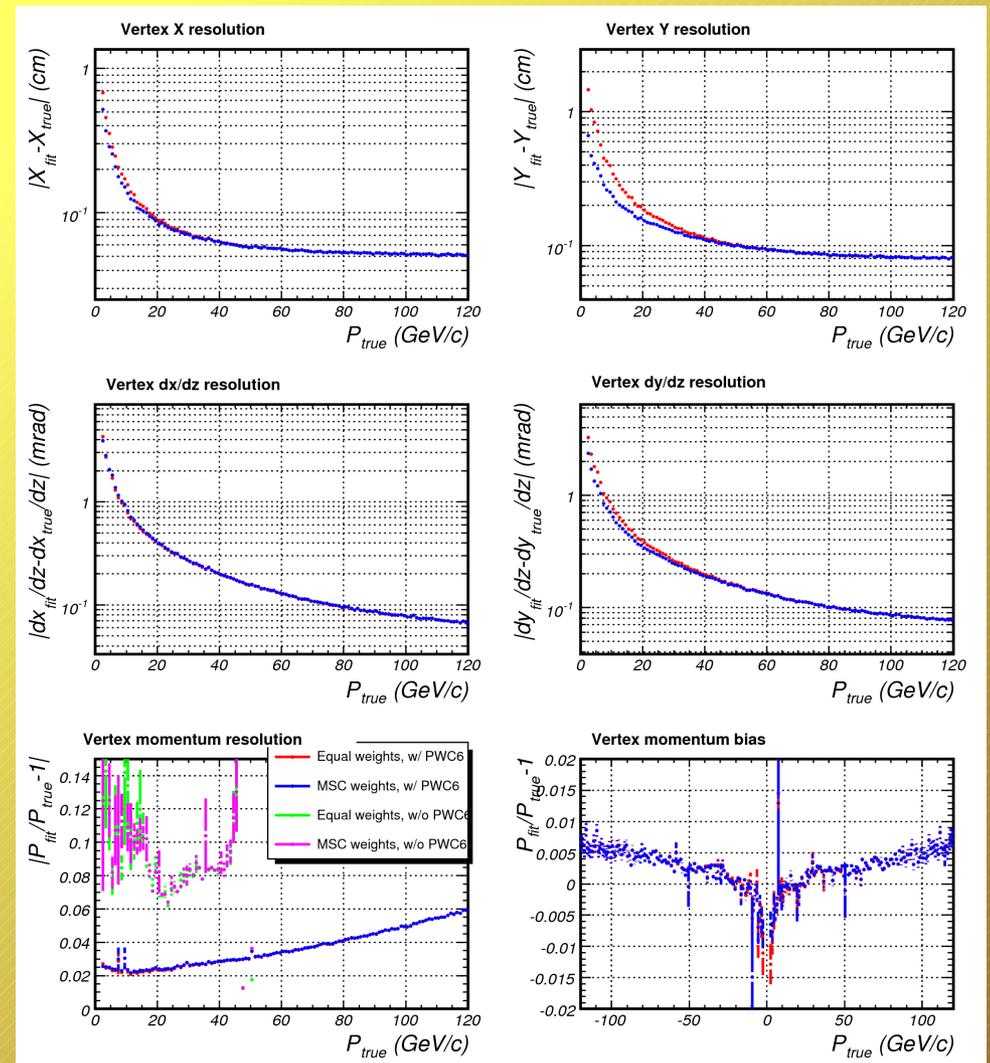
- We have been using the following numbers in TrkCand and VtxConFit: {0.36, 0.83, 1.24, 4.40, 4.98, 16.0} cm GeV/c
- These are more or less similar





Resolution of Vertex Parameters

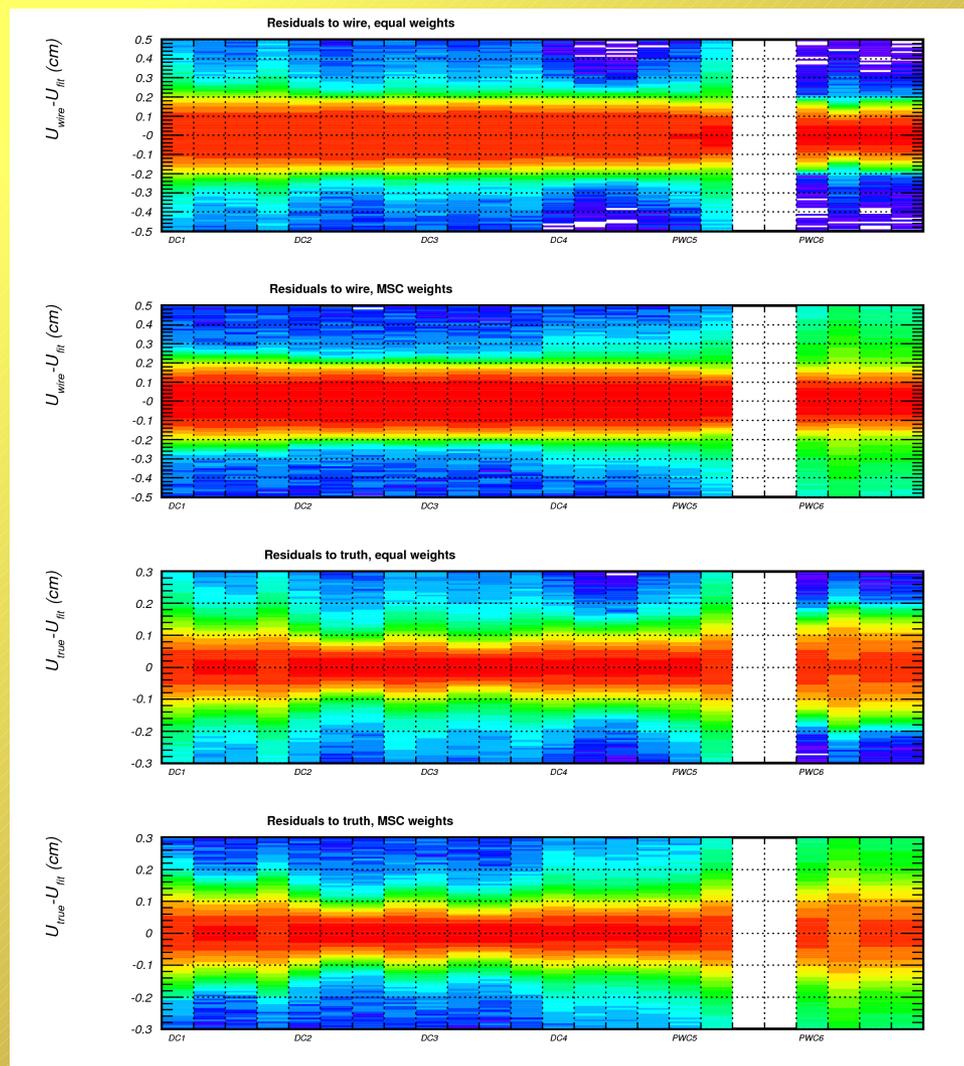
- The plots show resolution from wire spacing weight in red and MSC-adjusted weights in blue
- Momentum bias must come from scattering, except at low P





Residuals

- The residuals from wire and truth position shown on log z scale
- As intended, MSC does better at DC1, but worse at PWC6





Summary

- One-track Monte Carlo is available
 - Generates and “reconstructs” $1e6$ tracks in ~ 7 hours
- MSC-adjusted weights improve resolution of vertex parameters, but degrade position at PWC6
 - I don't think that's what we want, since TPC will do the job of determining vertex $(x, y, z; dx/dz, dy/dz)$
- Identify source of momentum bias
- More results to come soon