Simulation of M2-M3 beamlines: Results with G4BL

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Muon campus beam dynamics phone meeting
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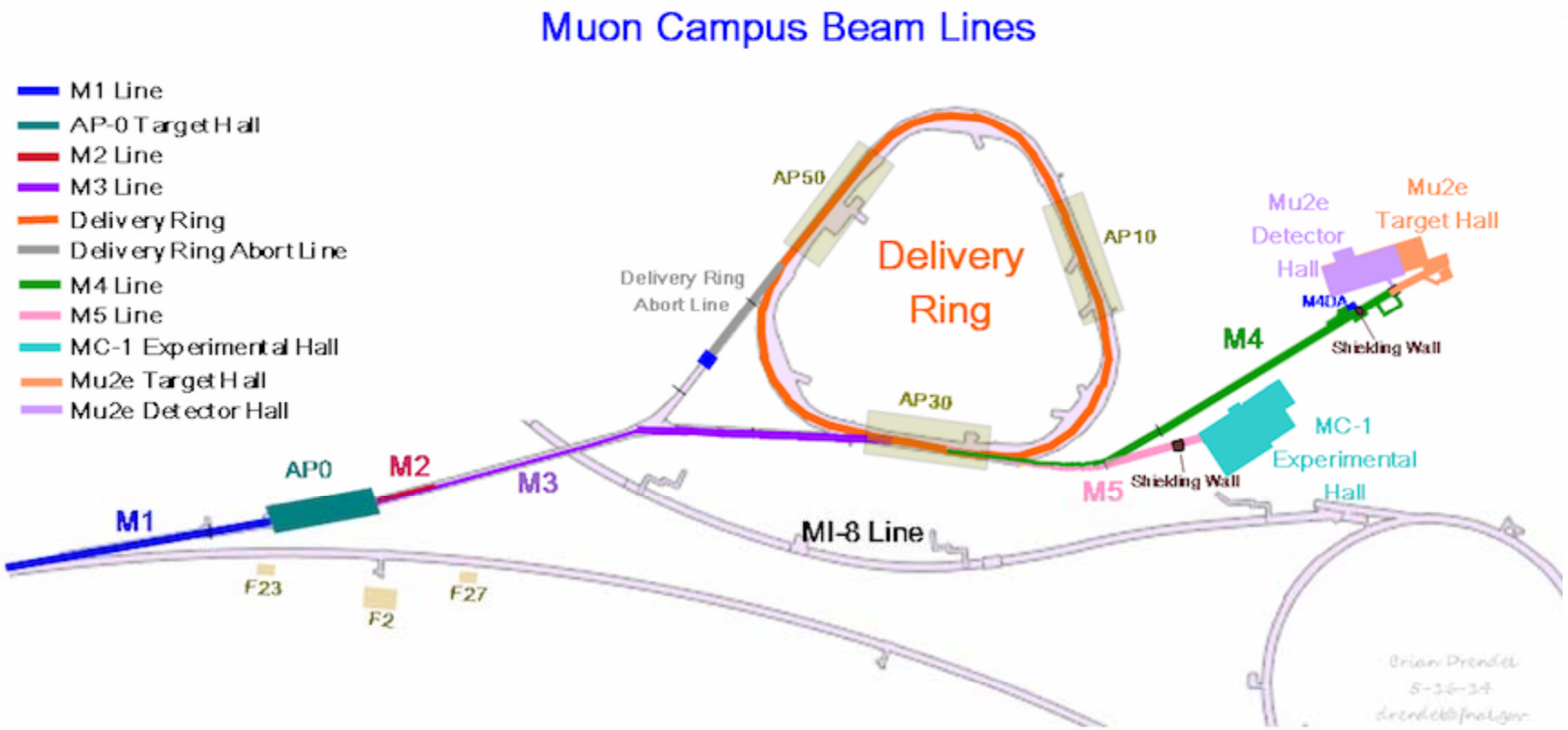
Outline

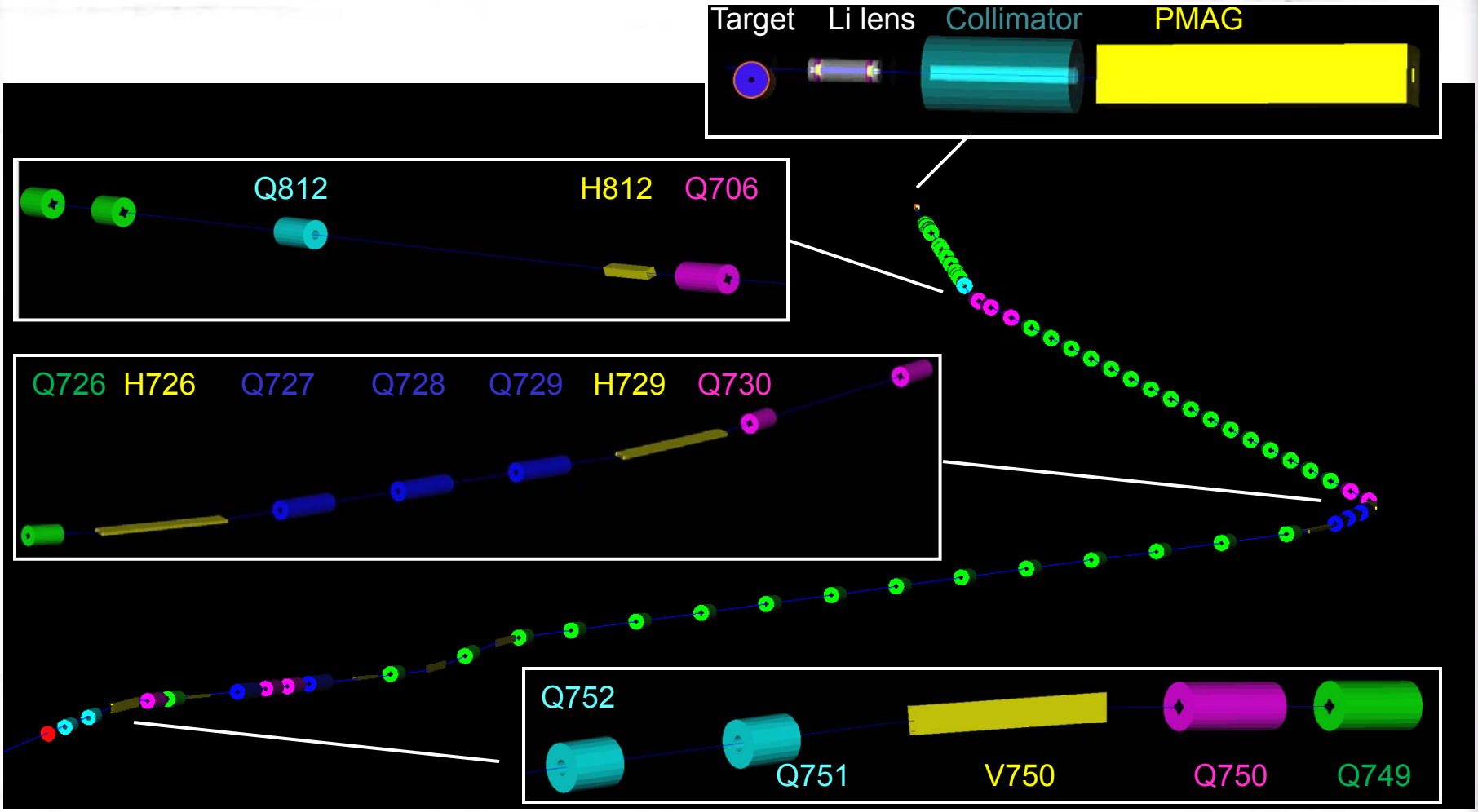
- Overview
- G4Beamline (G4BL) model
- Initial distribution
- Simulation results for M2M3 beamline
  - Results with & without decays
- Summary

Muon campus

- Two experiments: g-2 and mu2e

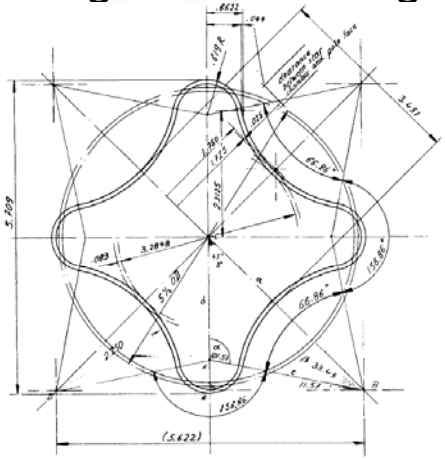


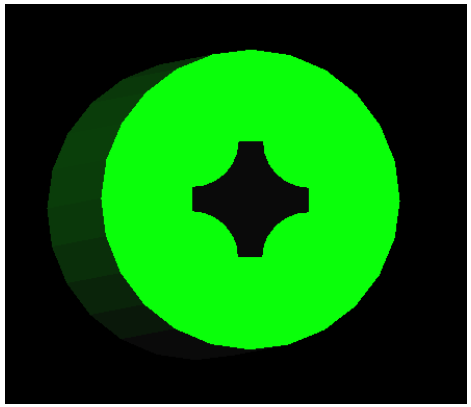
G4BL model: M2-M3 beamlines

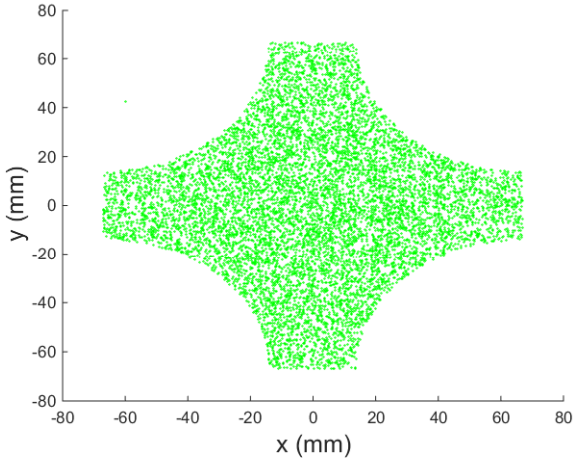


G4BL model: SQ magnets

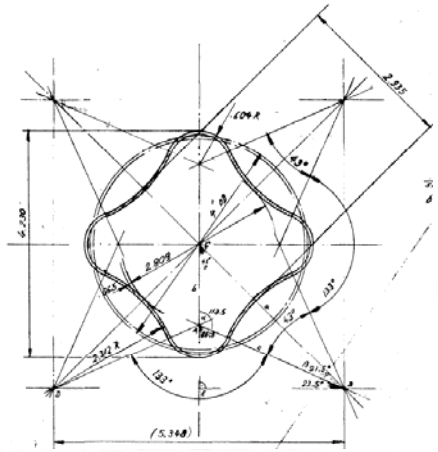
- Large star SQ magnet (M2, delivery ring, early stages of M3)

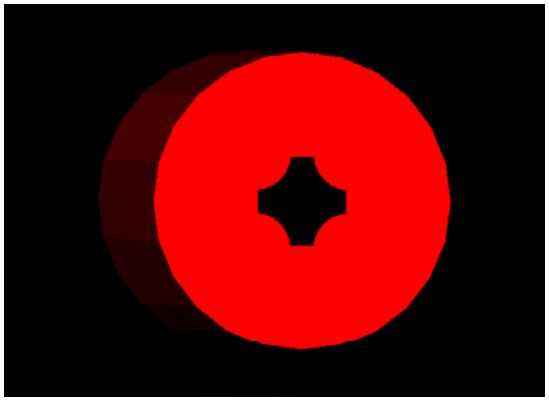


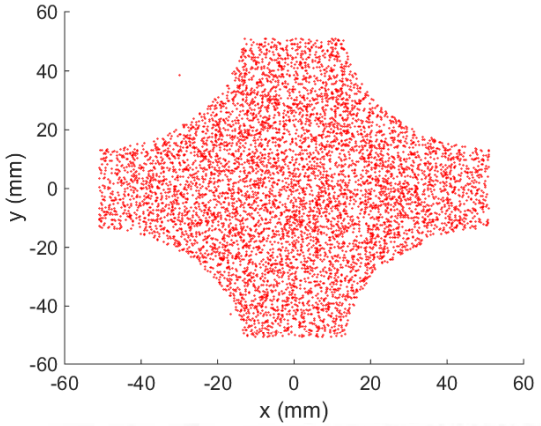




- Small star SQ magnet (late stages of M3)



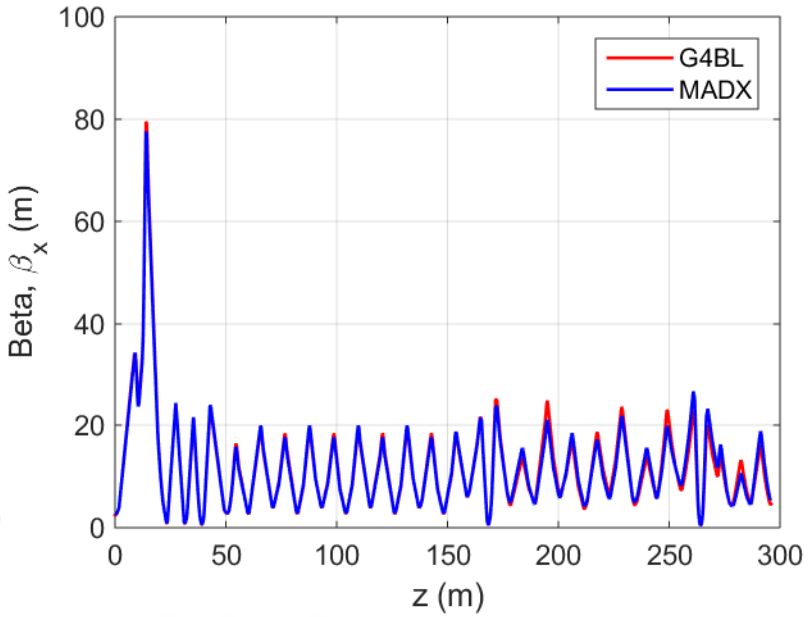


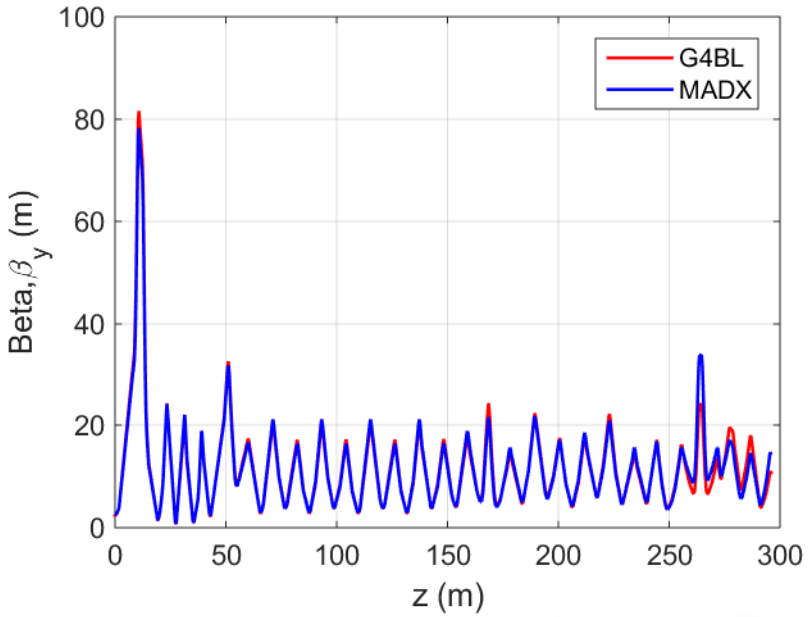


More details: Morgan, Stratakis in g2-doc-3388

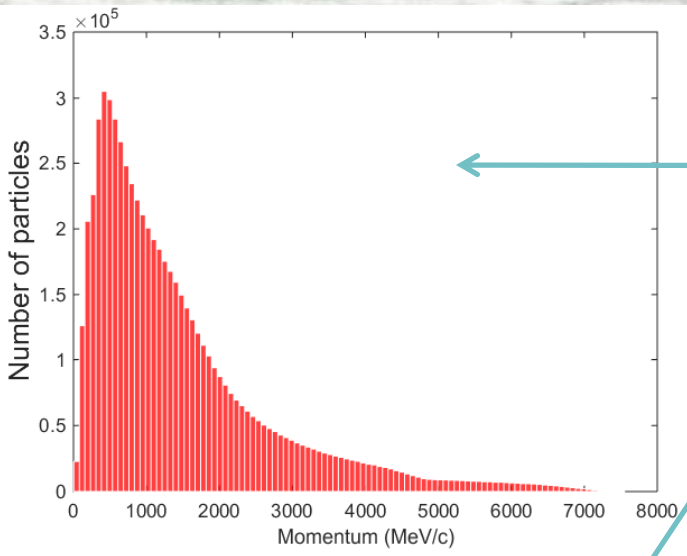
Optics model cross-check

- MAD8 model available: g2-doc-700-v13
- A comparison of the lattice functions between MAD8 and G4BL shows satisfactory agreement



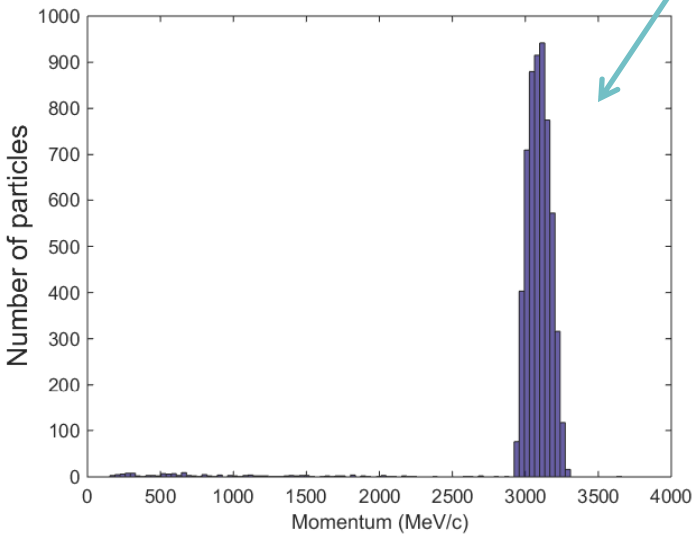


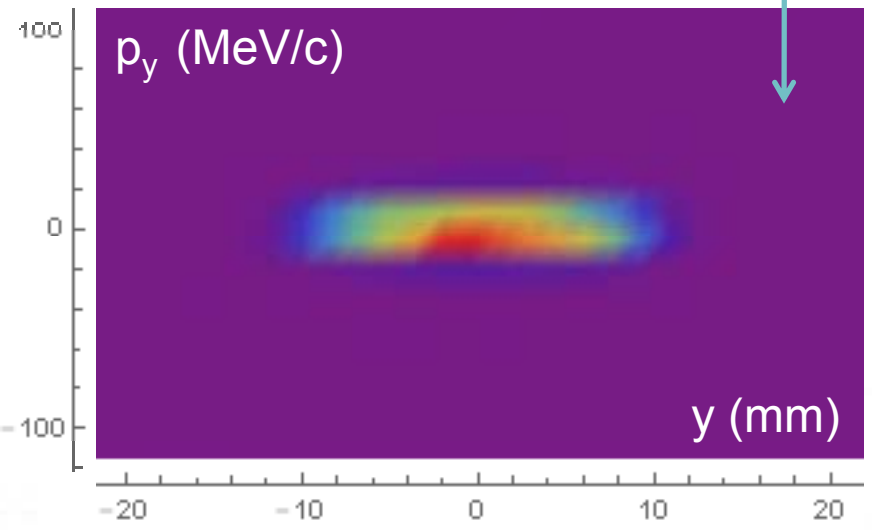
Acceptance analysis



Particles after the target

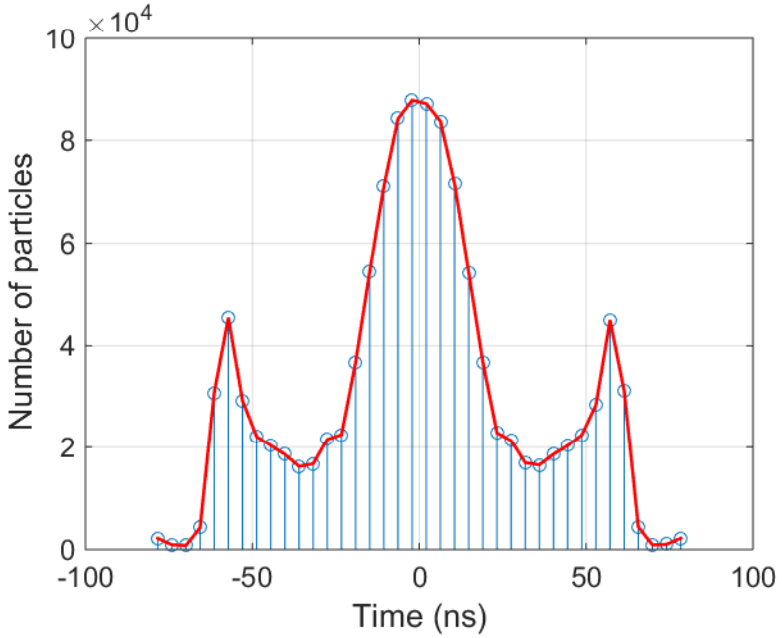
Particles that make it to the end of M3

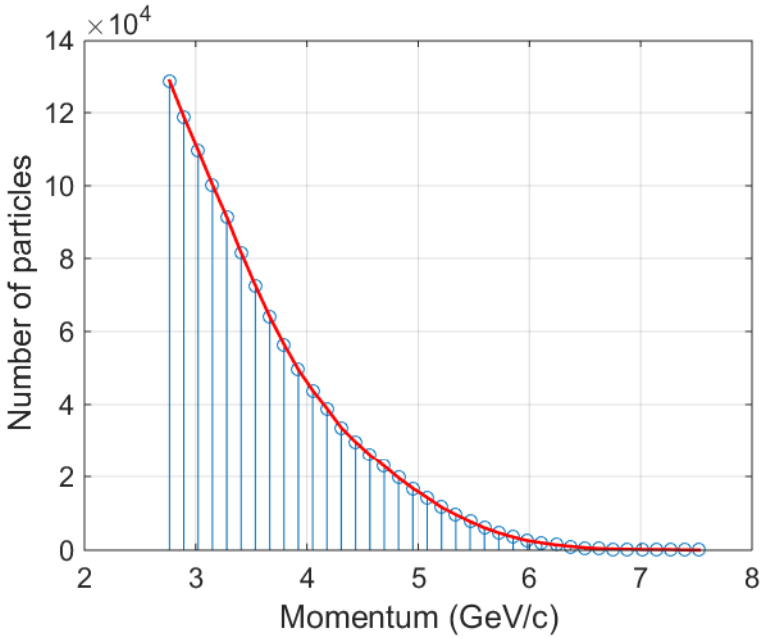




Beam distribution after target

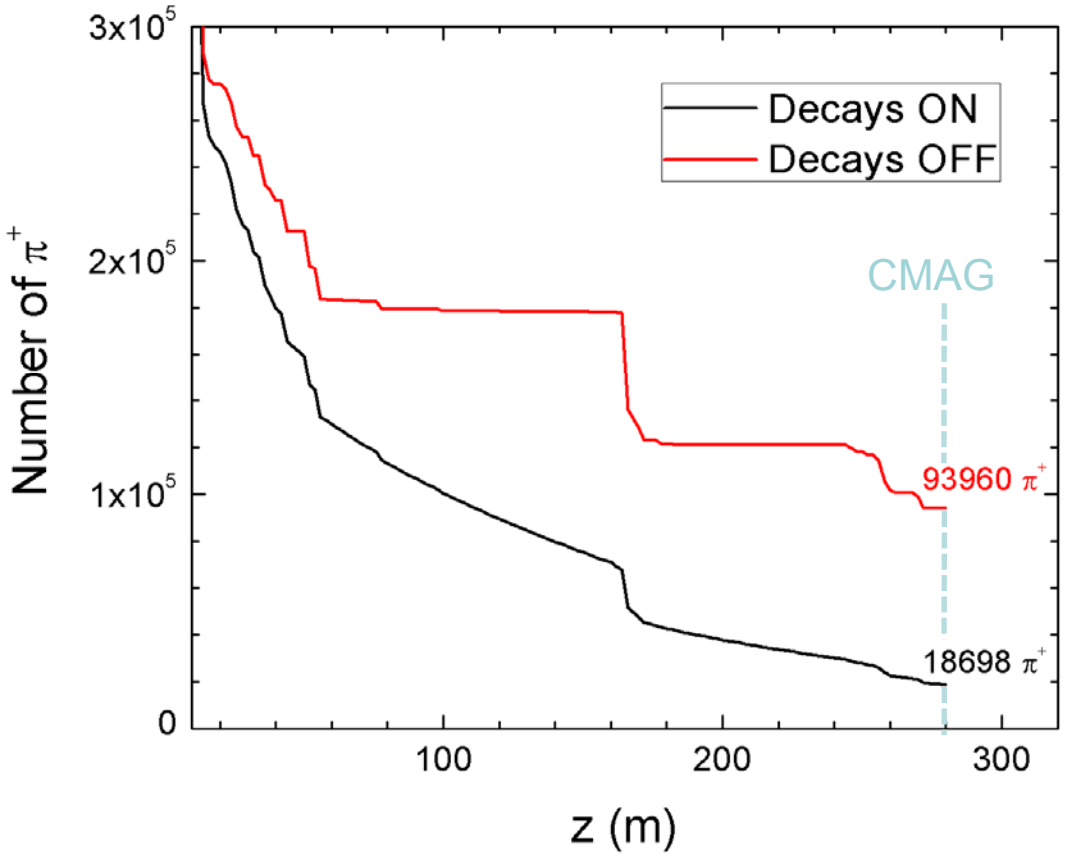
- Use distribution published at: g2-doc-3277
- Is the result of 8 GeV 10^9 POT



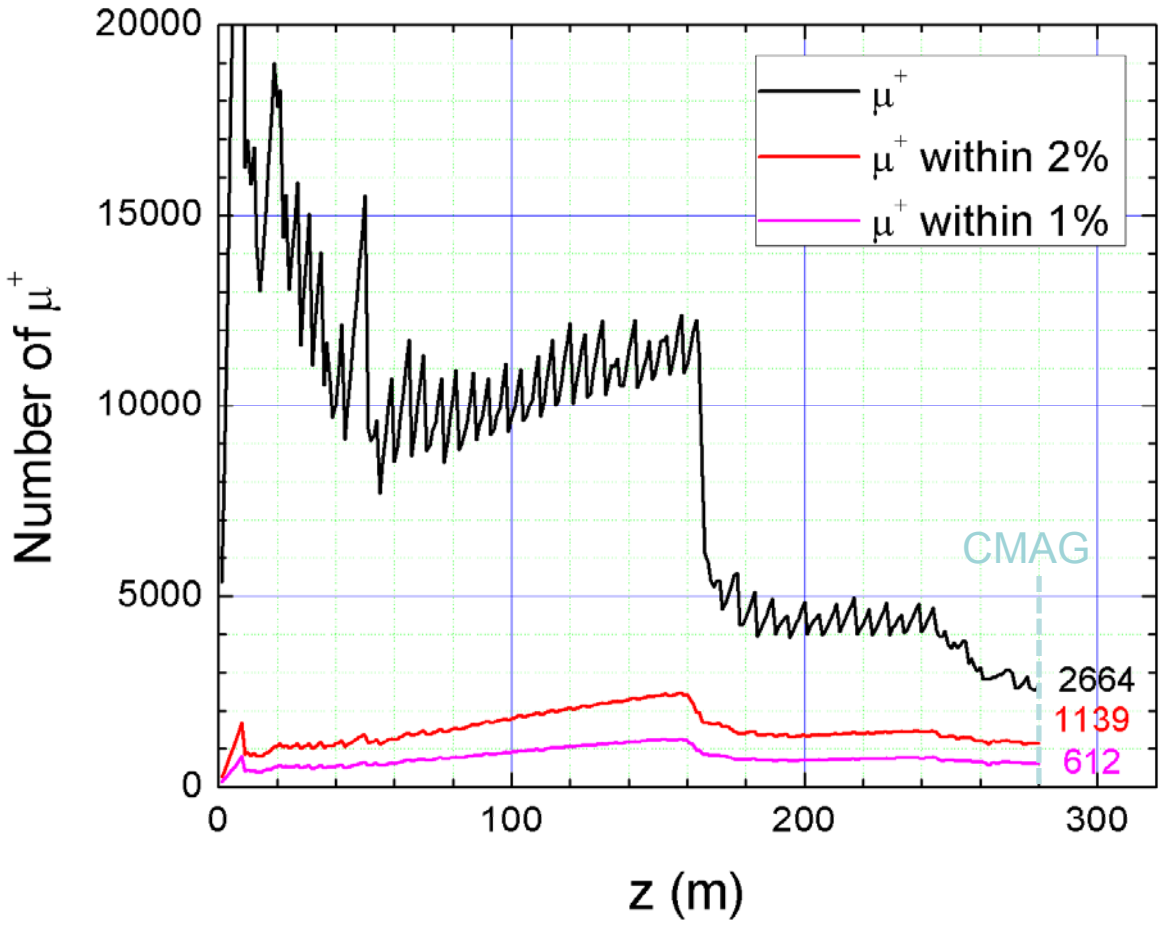


Pion transport

- Transport along M2-M3 beamlines

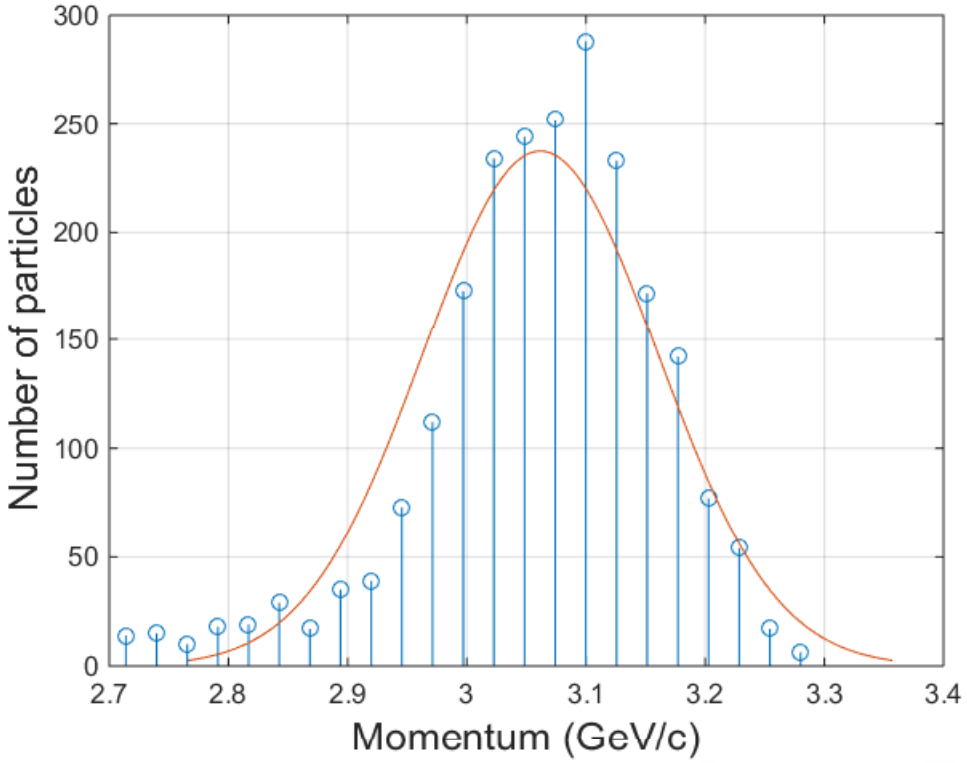


Muon transport



Momentum distribution

- End of M2-M3 (CMAG)



Parameter	Value
Mean, P	3061 MeV/c
σ	98.2 MeV/c
dp/p	3.2%

Discussion

- Discussion