Mu2e-II Tracker Simulations

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Snowmass White Paper Simulations (Mu2e-II)

- Mu2e Simulation
  - Branch of Offline
  - Detailed simulation
  - Realistic pileup background and reconstruction
  - Only (tracker) difference: thinner straws
- TrackToy
  - Toy MC with variable straw density, resolution, …
  - KinKal track fit
  - No Pattern recognition
- G4Beamline (?)

AMF Simulation Needs

- Proton beam -> Production Target
  - Beam transport, …
- Pion production
  - radiation dose, power/heat, pion transparency, extinction monitoring, …
- Muon transport and preparation (FFA)
  - Accelerator dynamics, insertion/extraction, stopping target, muon decay/capture, flash removal, …
- Muon stopping
  - Stopping target, muon intensity monitor, daughter production, …
- Muon daughter transport
  - DIO collimation, signal $e^{\pm}$ selection, solenoid design, …
- (Signal) muon daughter detection
  - Detector solenoid, detector design, residual pileup effects, …

Proposal: Compartentalized Simulations

- G4Beamline for proton beamline
- G4/Mars for production target
- Standard accelerator simulation tools for FFA (?)
- G4 for muon stopping, daughter production
- G4Beamline for muon daughter transport (?)
- TrackToy for detector modeling
  - Fast, flexible
  - Needs upgrades
- How do we connect the pieces?