



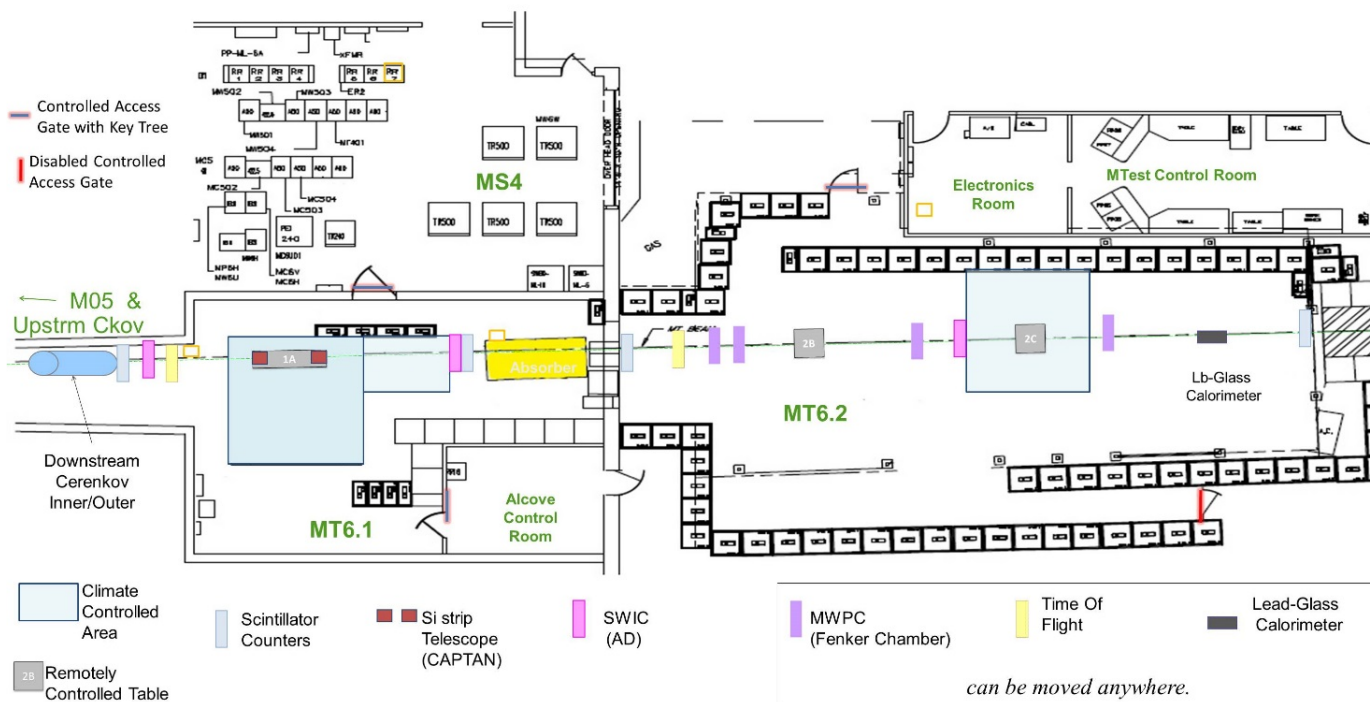
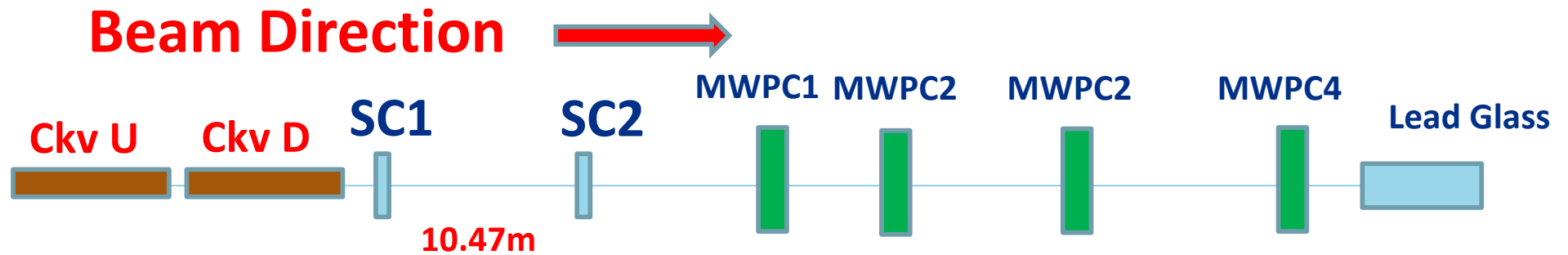
Muons at the Test Beam

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Precision Science Working Group

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Beam Instrumentation Layout – MTest



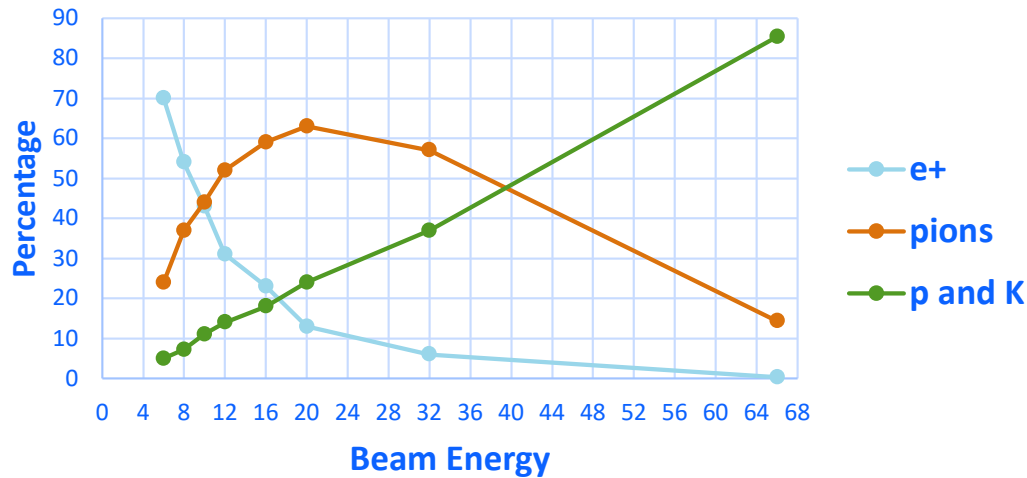
Beam Details and Infrastructure

- MTest Beam line
 - 120 GeV protons (primary)
 - 1 – 60 GeV secondary beam
 - Spot size about 2cm
 - Energy can be changed in just a few minutes
- MCenter Beam line
 - Tertiary beamline down to 200 MeV
 - Mainly used for longer term (~months) experiments
- Infrastructure available
 - Remote controlled motion tables, Gas hookups (including flammable) cameras, signal/HV/ethernet patch panels
 - Cables, supplies, test benches for prep work
 - Much more, just ask!



MTest Beam Composition Studies – In Progress

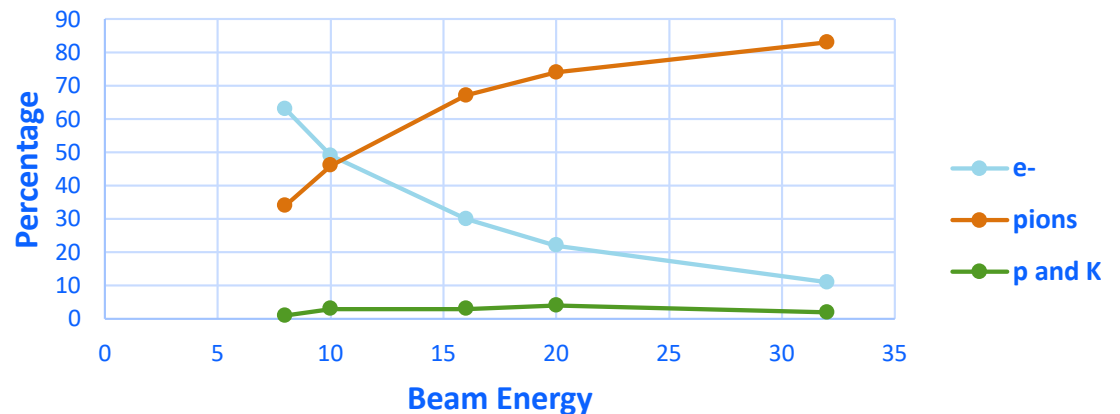
Positive Beams



Studies done by E. Skup and D. Jensen using Cherenkov Counter

- Plans to continue this study as schedule allows
- Put into a database with all running conditions recorded

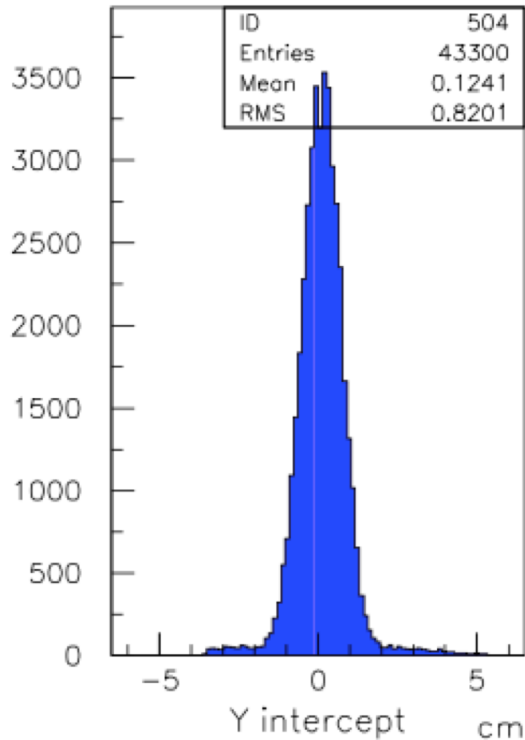
Negative Beams Composition, Open Collimators 2016



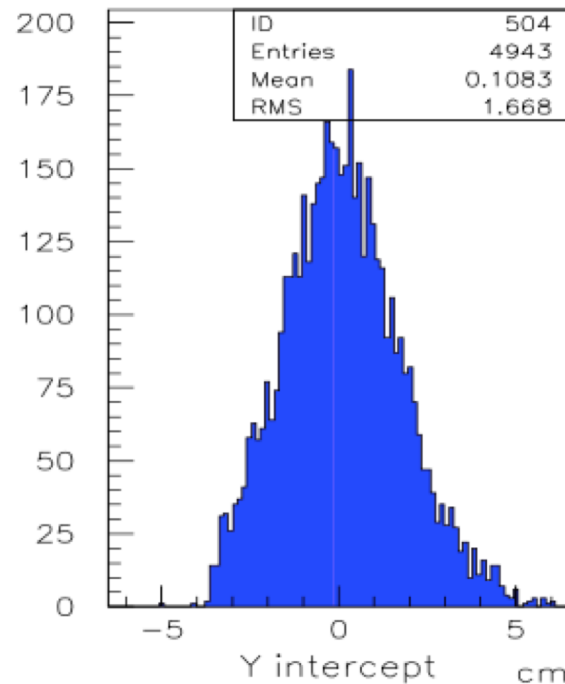
Muons at the Test Beam

- Recently used G4Beamline to simulate the muons at the test beam. Used data take with MWPCs to confirm the simulation.

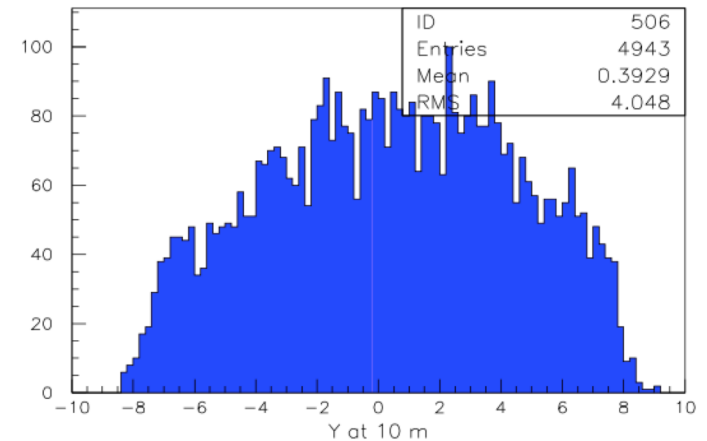
32 GeV Pion Beam



32 GeV Muon Beam After absorber



32 GeV Muon Beam 10m from absorber



Studies done by D. Jensen



Studies in the pipeline

- D. Jensen suggested a program to test the 60 GeV beam
 - Run with both Cherenkov detectors, one tuned for electrons, one for muons/pions
 - Use MWPCs for tracking
 - Use our lead glass for electron identification
- We will study the highest pion beam in both polarities
- Had plans with the AD to install a magnet for users
 - Small, so could be removed
 - Possibly permanent

Discussion

- Are there other small, fix target like experiments we could do at the Test beam or in similar lines?
 - Maybe MEast comes back
 - NM4 (used for SeaQuest currently)
 - Irradiation facility on track
- Long shutdown for DUNE/LBNF (2024/2025)
 - Good time to make upgrades to the facility or build a new one
 - Need community input.