Study 2 Yields for Solid W Target

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Introduction

- MARS simulations of solid tungsten cylindrical rods in Study 2 geometry

- Proton beam:
  - kinetic energy of 10 GeV
  - $r_{\text{beam}} = r_{\text{rod}}$
  - $\theta_{\text{beam}} = \theta_{\text{rod}}$ w.r.t. $z$ axis

- Plots of accepted charge-averaged yields per proton for different rod lengths, tilts and radii.
Charge averaged $\pi, \mu$ accepted yield per proton for $r_{\text{beam}} = 0.25 \text{ cm}$

Dotted line is Hg jet yield for 10 GeV beam (using StudyII optimal tilt, radii)
Charge averaged $\pi, \mu$ accepted yield per proton for $r_{\text{beam}} = 0.50 \text{ cm}$

Dotted line is Hg jet yield for 10 GeV beam (using StudyII optimal tilt, radii)
Charge averaged $\pi, \mu$ accepted yield per proton for $r_{beam} = 0.75 \text{ cm}$

Dotted line is Hg jet yield for 10 GeV beam (using StudyII optimal tilt, radii)
Charge averaged $\pi, \mu$ accepted yield per proton for $r_{\text{beam}} = 1 \text{ cm}$

Dotted line is Hg jet yield for 10 GeV beam (using StudyII optimal tilt, radii)
Charge averaged $\pi, \mu$ accepted yield per proton for $r_{\text{beam}} = 1.5 \text{ cm}$

Dotted line is Hg jet yield for 10 GeV beam (using StudyII optimal tilt, radii)
Maximum Yield Ratio

Ratio of the maximum yield for the W solid target compared to the yield for the Study 2 optimum Hg jet (always 11.0 ± 0.1% per proton)