Carbon Target Parameters and Particle Distributions for Front End Study (Discussion)

X. Ding
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Introduction

• MARS15 (BNL Spot Cluster)
• ROOT based geometry setting without BE windows for 20t02T5m and 20to 4T5m configuration (Carbon target, 1.8 g/cm³)
• No SMIN card and 400,000 events
• KE at 6.75 GeV, 5 micron beam emittance, launched at z = -100 cm (other beam emittance?)
• Collect all particles at z = 50 m with KE selection of min. of 40 MeV and max. of 180 MeV or 300 MeV
• Particle distribution at z = 2 m and 5 m (other location ?) for Front End Study (N = 400,000 or 2000,000?).
Carbon Target Parameters for Front End Study?

• Target Length: 100 cm
• Target Radius: 1 cm
• Beam Radius: 0.25 cm
• Beam Angle or Target Angle: 65 mrad
• Beam/Target Crossing Angle: 0 mrad
Backup
20to4T5m Configuration
(TR = 0.8 cm, BR = 0.2 cm, CA = 0, BA = 65 mrad)
20to4T5m Configuration
(LEN = 100 cm, TR/BR = 4, CA = 0, BA = 65 mrad)
20to4T5m Configuration
(Len = 100 cm, TR = 0.8 cm, BR = 0.2 cm, CA = 0)
20to4T5m Configuration

(LEN = 100 cm, TR = 0.8 cm, BR = 0.2 cm, BA = 65 mrad, CA = 0)
20to2T5m Configuration
(TR = 0.8 cm, BR = 0.2 cm, CA = 0, BA = 65 mrad)
20to2T5m Configuration
(LEN = 100 cm, TR/BR = 4, CA = 0, BA = 65 mrad)

![Graph showing yield vs. target radius for two energy ranges: 40 ≤ KE ≤ 180 MeV, z = 50 m (red line) and 40 ≤ KE ≤ 300 MeV, z = 50 m (blue line). The x-axis represents target radius in cm, and the y-axis represents yield.](image)
20to2T5m Configuration

(LEN = 100 cm, TR = 0.8 cm, BR = 0.2 cm, CA = 0)
20to2T5m Configuration

(LEN = 100 cm, TR = 0.8 cm, BR = 0.2 cm, BA = 65 mrad, CA = 0)