Meson Production Comparison between Hg and Ga at 8 GeV

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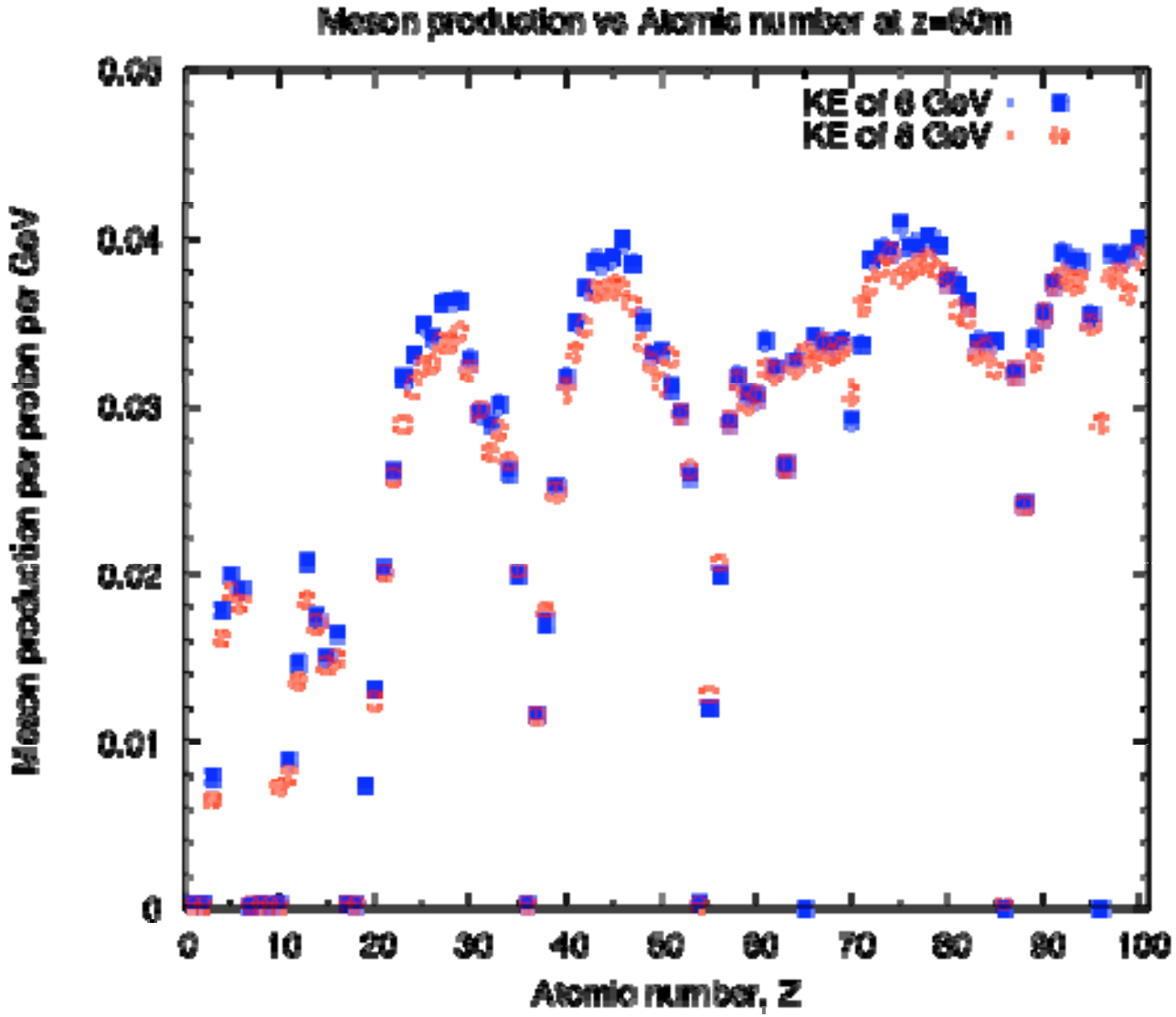
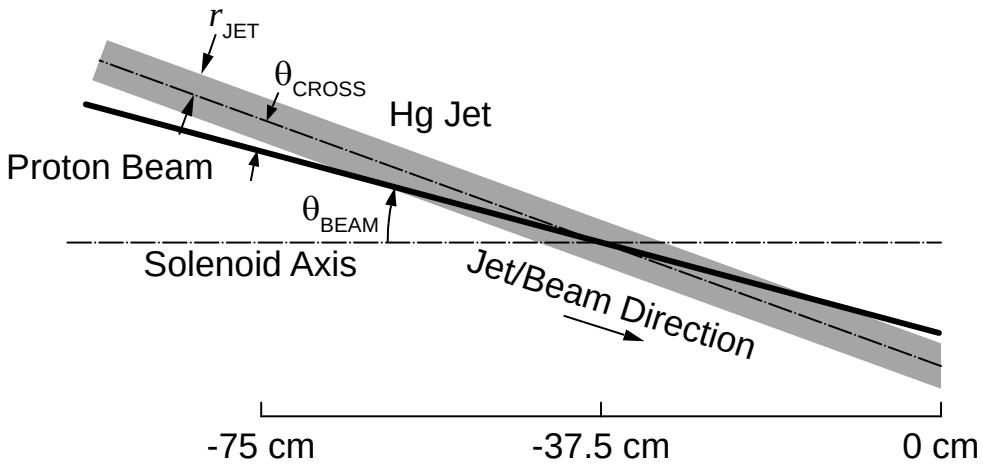
Meson Productions at 6 and 8 GeV

(All using the same geometry as Hg case)



Optimized Target Parameters at z=-37.5 cm



The mercury jet target geometry. The proton beam and mercury jet cross at z=-37.5 cm.

Target material	Hg	Ga
Target radius (Rtg)	0.38 cm	0.42 cm
Proton Beam Angle (θb)	99 mrad	77 mrad
Crossing Angle of Beam/Jet (θc)	19.14 mrad	9 mrad
Path length of proton beam inside the jet [2Rtg/sin(θc)]	39.7 cm	93.3 cm

Meson Production Comparison at Z = 5000 cm

Target material	Hg	Ga
Meson Production per proton per GeV (errorbar) before optimization (0.5cm/67mrad/33mrad)	0.03665 (0.0003)	0.02961 (0.00026)
Meson Production per proton per GeV (errorbar) after optimization	0.039837 (0.00032) (14.3% higher than GA case)	0.034157 (0.00028)

The new optimization is based on a jet that with azimuth below the beam at z = -37.5 cm.

Further optimization with different azimuths is possible.

BACKUP

MARS Results by J. Back