Optimization of a Gallium Target

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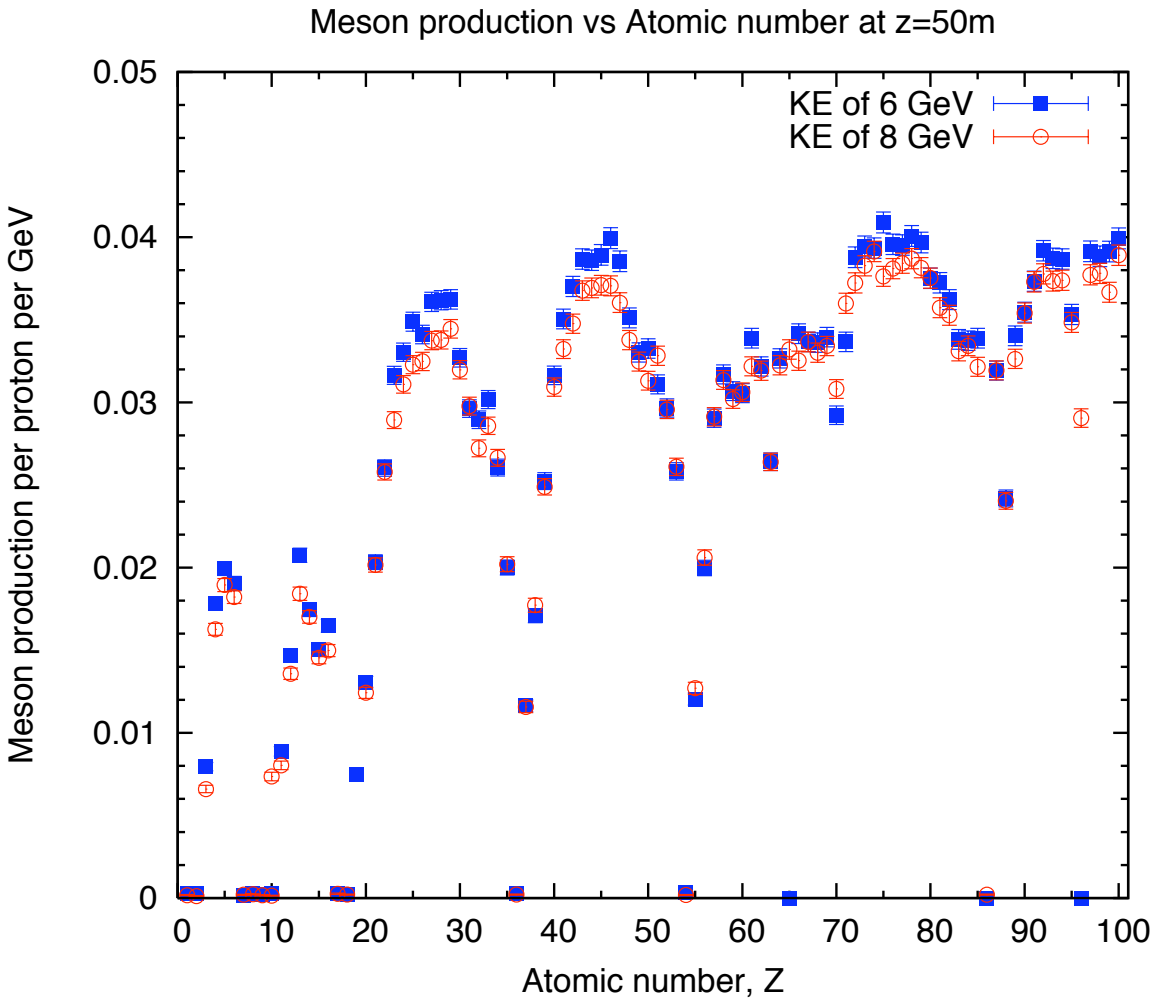
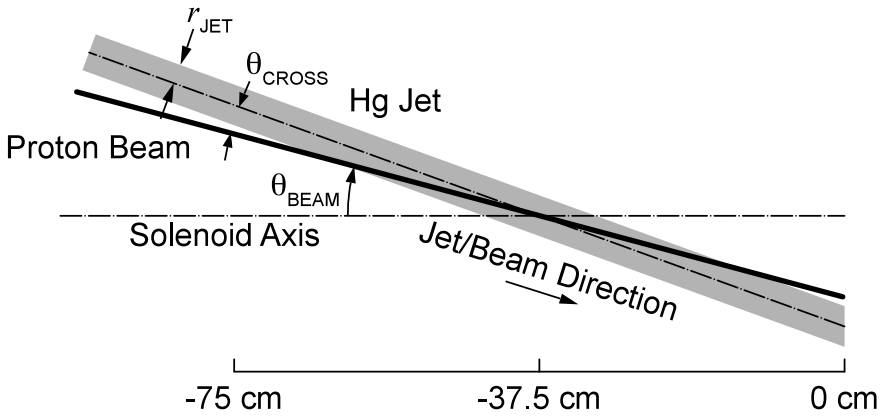
Meson Productions at 6 and 8 GeV

(All using the same geometry as Hg case)



Optimized Target Parameters at z=-37.5 cm



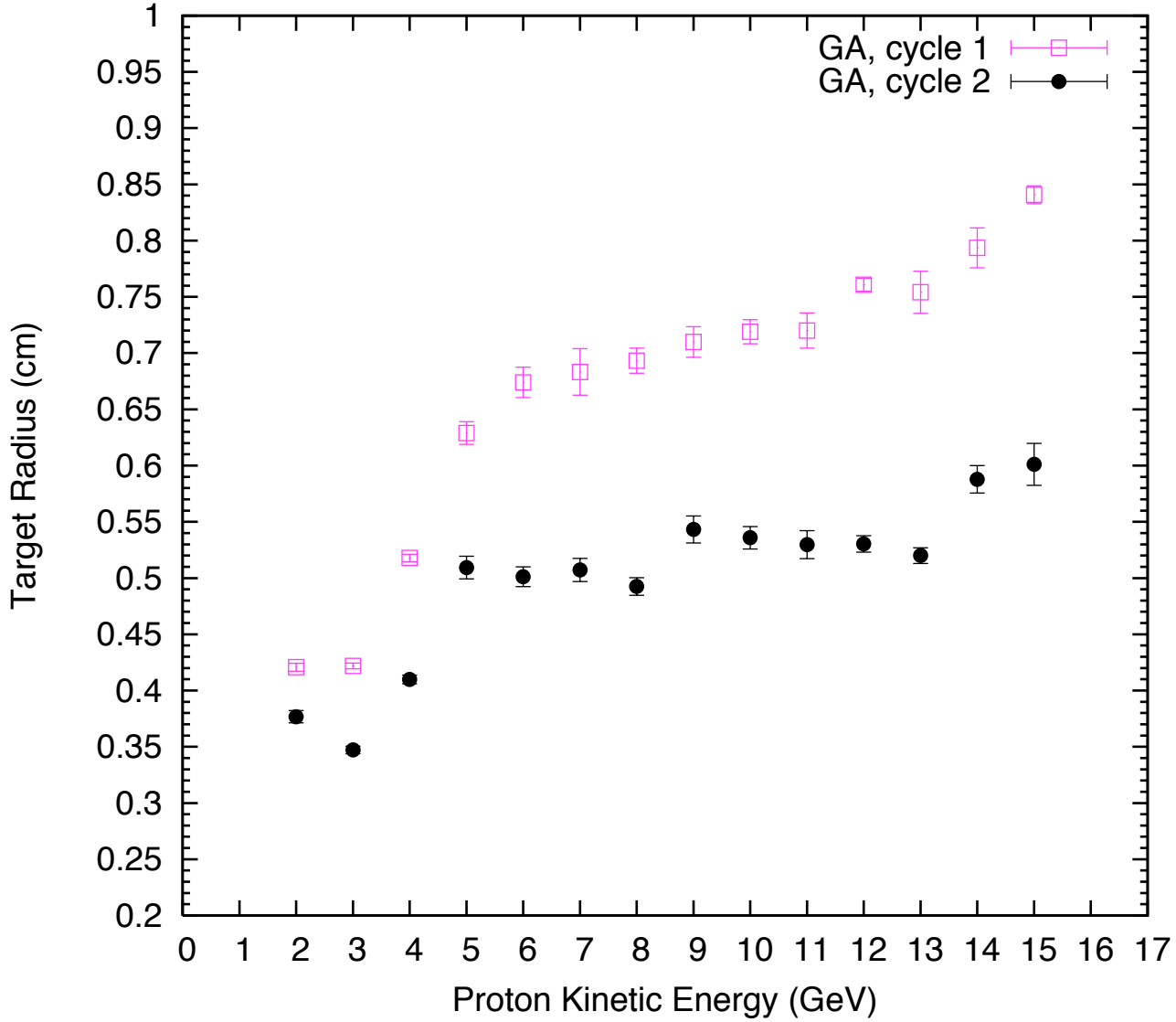
The mercury jet target geometry. The proton beam and mercury jet cross at z=-37.5 cm.

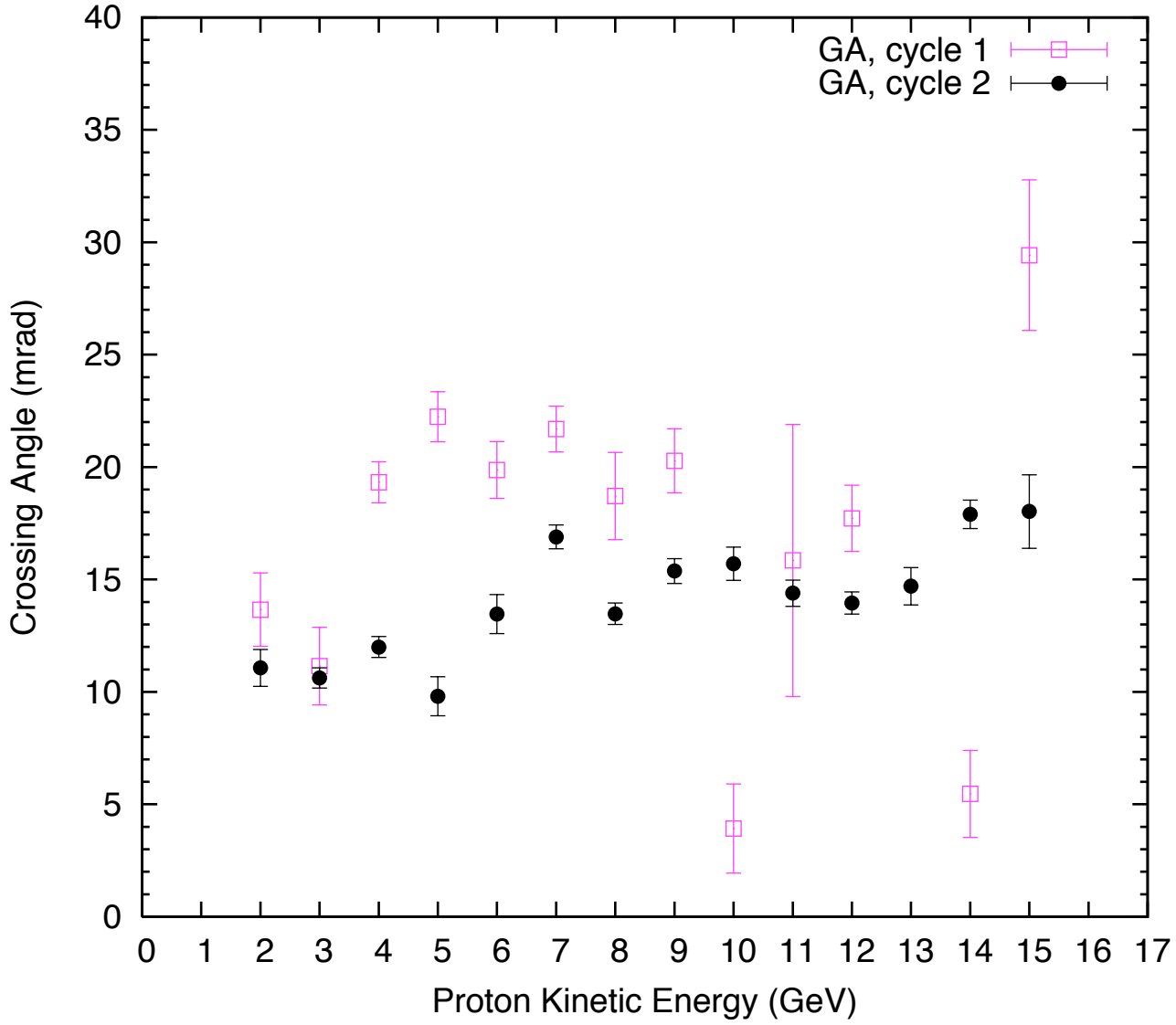
New optimization procedure with Study-2a Geometry and fieldmap,
(beam below the HG jet exactly at z=-37.5 cm and project beam back to z=-75cm.)

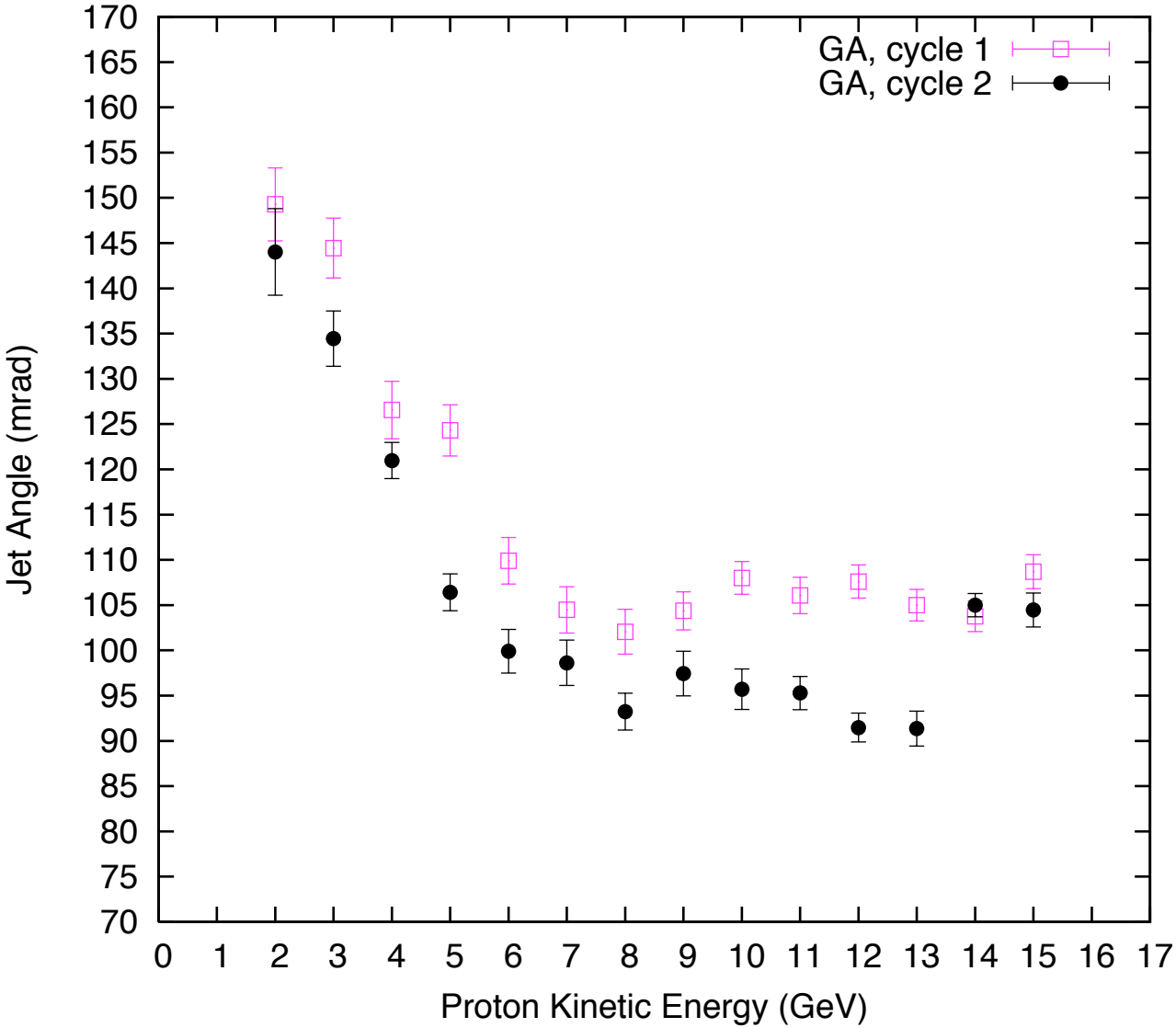
1) Vary jet radius

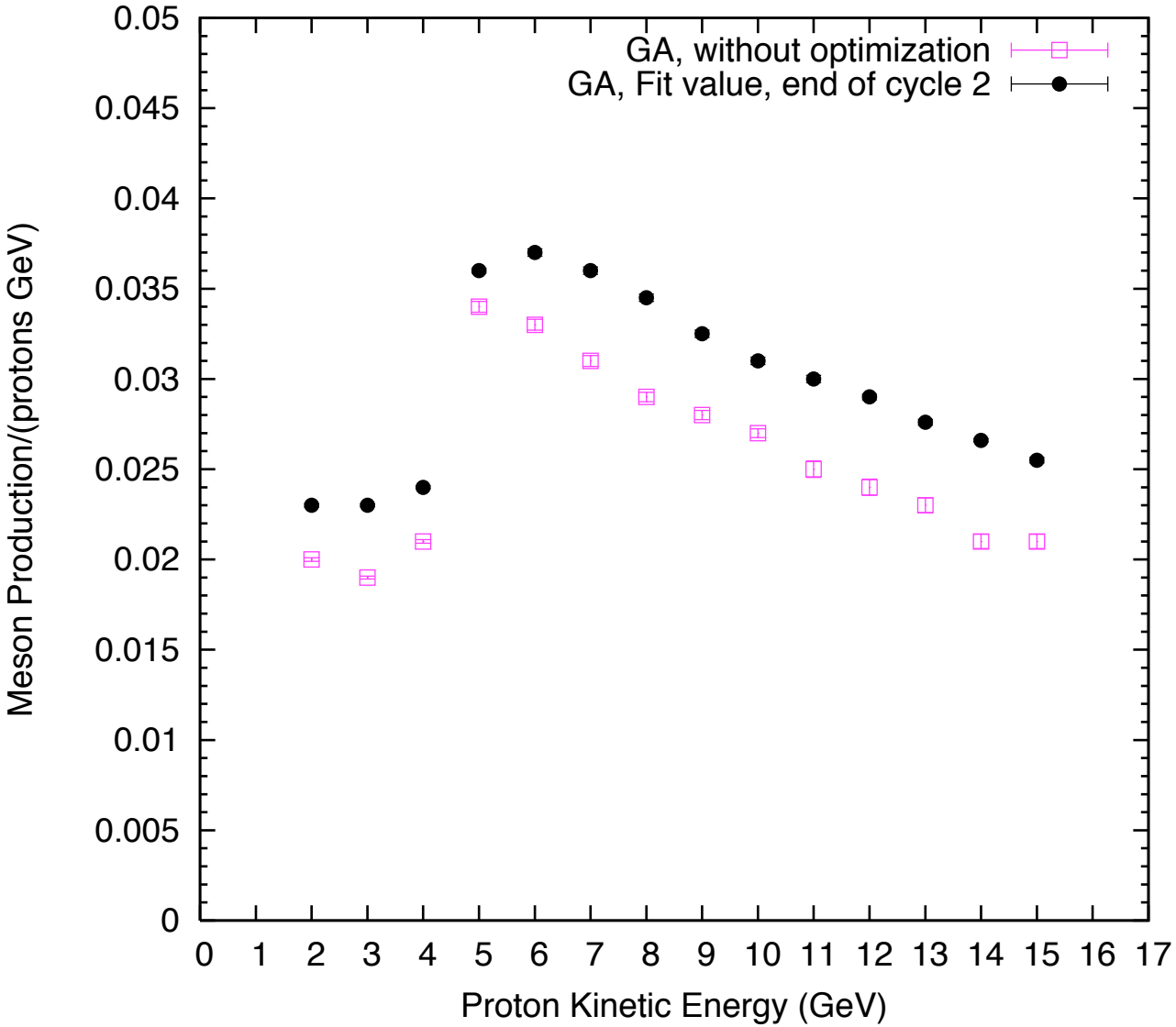
2) Vary beam/jet crossing angle while keeping jet fixed - always project beam back to z=-75cm

3) Vary jet angle-always keep crossing angle constant-both jet and beam must be rotated about intersection point together always project beam back to z=-75cm.


GA, cycle 1
GA, cycle 2
Target Radius (cm)
Proton Kinetic Energy (GeV)
1
0.95
0.9
0.85
0.8
0.75
0.7
0.65
0.6
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17


GA, cycle 1
GA, cycle 2
Crossing Angle (mrad)
Proton Kinetic Energy (GeV)
0
5
10
15
20
25
30
35
40
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17


GA, cycle 1
GA, cycle 2
Jet Angle (mrad)
Proton Kinetic Energy (GeV)
170
165
160
155
150
145
140
135
130
125
120
115
110
105
100
95
90
85
80
75
70
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17


GA, without optimization
GA, Fit value, end of cycle 2
Meson Production/(protons GeV)
Proton Kinetic Energy (GeV)
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

BACKUP

MARS Results by J. Back

Useful pion/muon yields for different Z's and beam energies (J.Back)