SRIM Simulation of the MEBT Absorber

April 26, 2012

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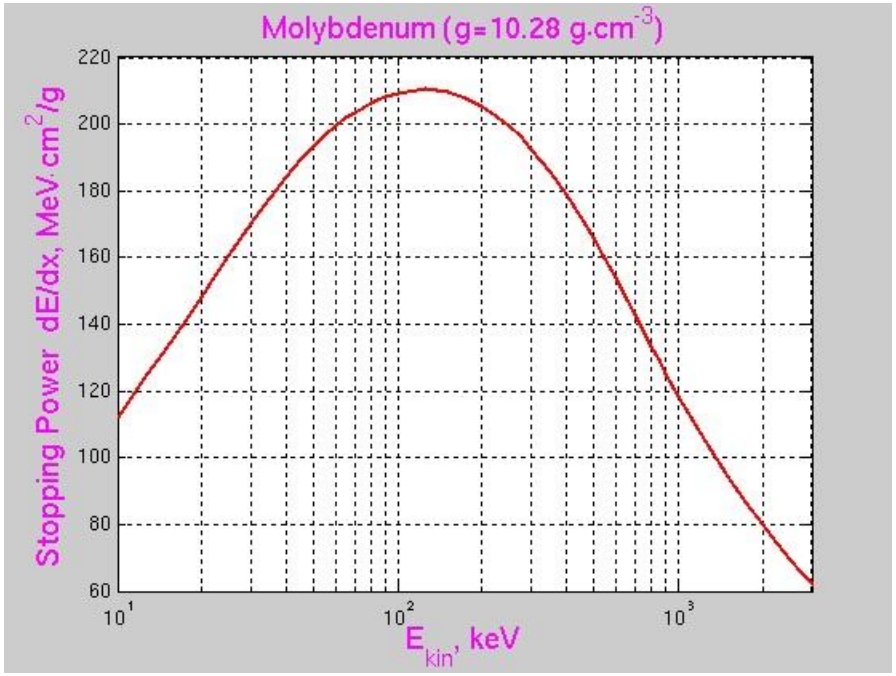
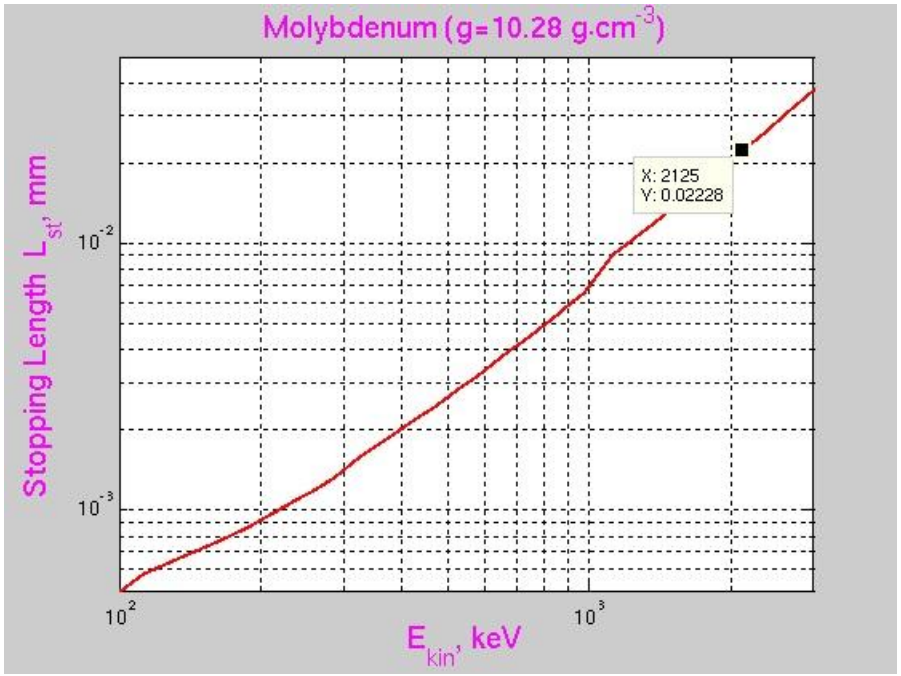
Multiple Scattering (Mo)

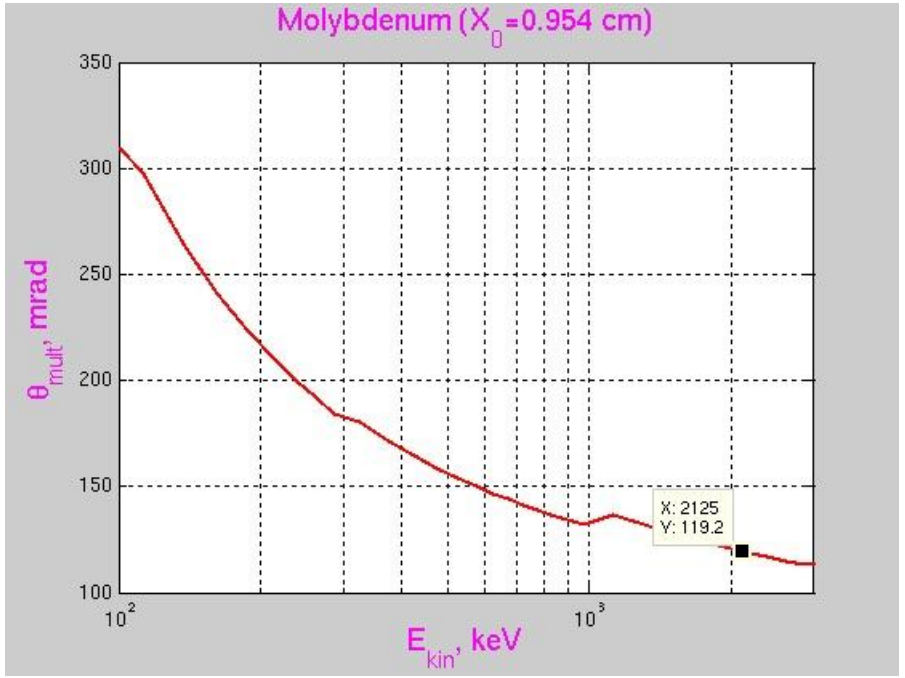


$$L_{st}(E_{kin}) = \int_0^{E_{kin}} \left(\frac{dE}{dx}\right)^{-1} dE;$$

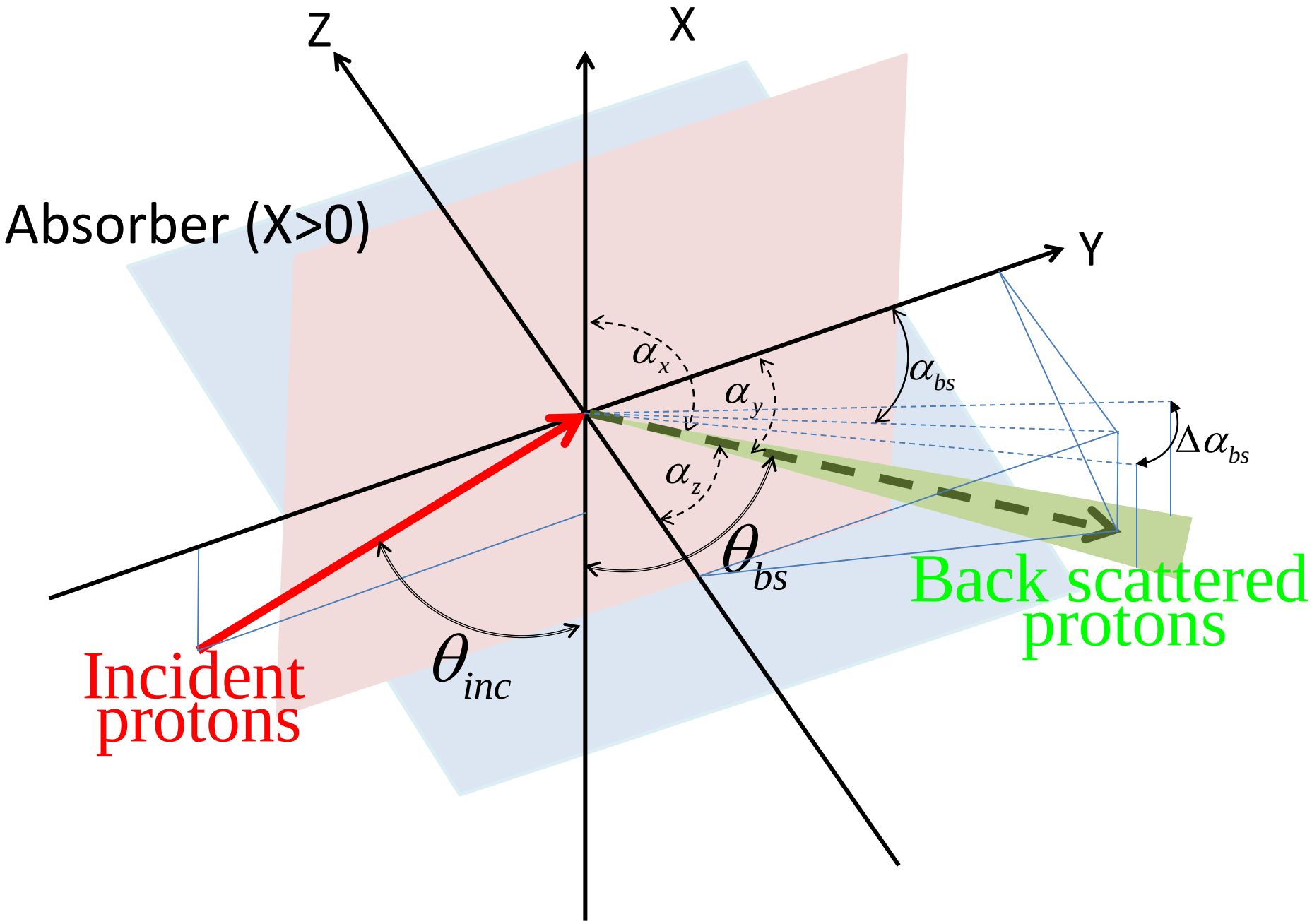
$$\beta cp = E_{kin}\frac{E_{kin}+2m_p}{E_{kin}+m_p};$$

$$\theta_{mult}(E_{kin}) = \frac{13.6\ \text{MeV}}{\beta cp}\sqrt{\frac{L_{st}}{X_0}}\left(1+0.038\cdot\ln\frac{L_{st}}{X_0}\right).$$

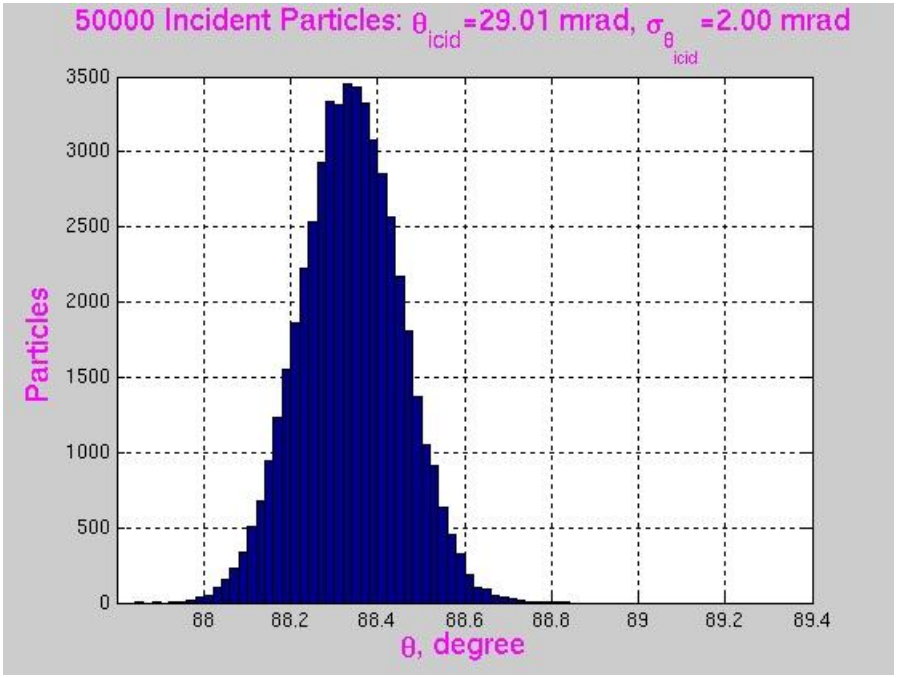




Geometry of the Back Scattering (for code SRIM)

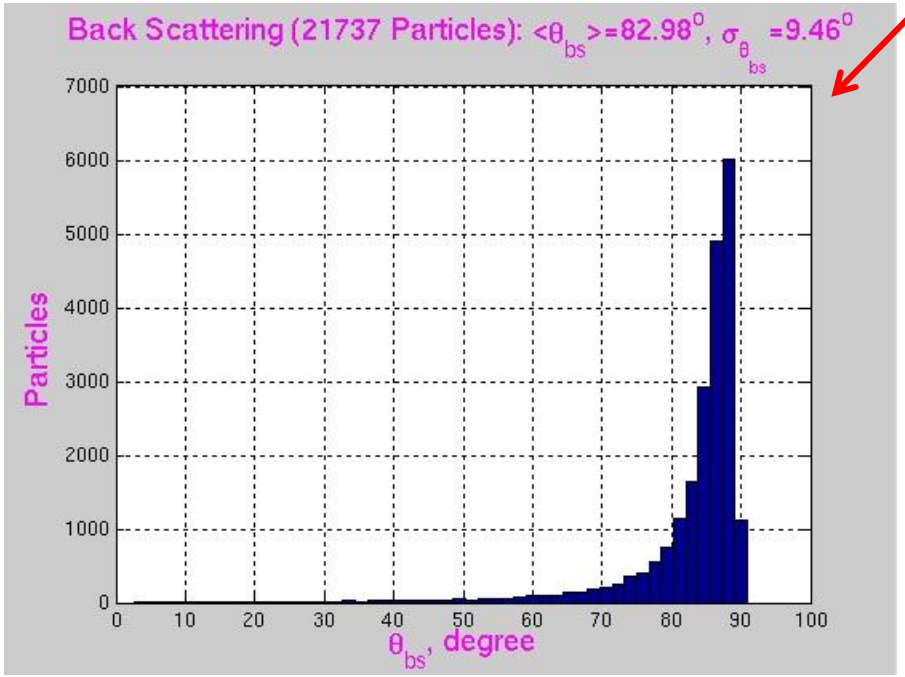


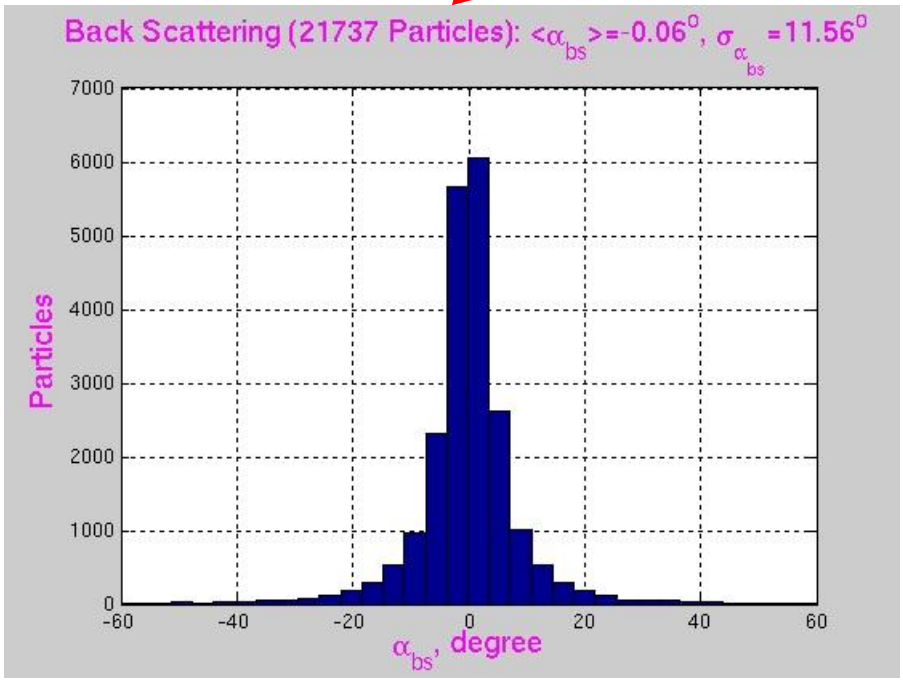
Incident and Back Scattered Particle Distributions

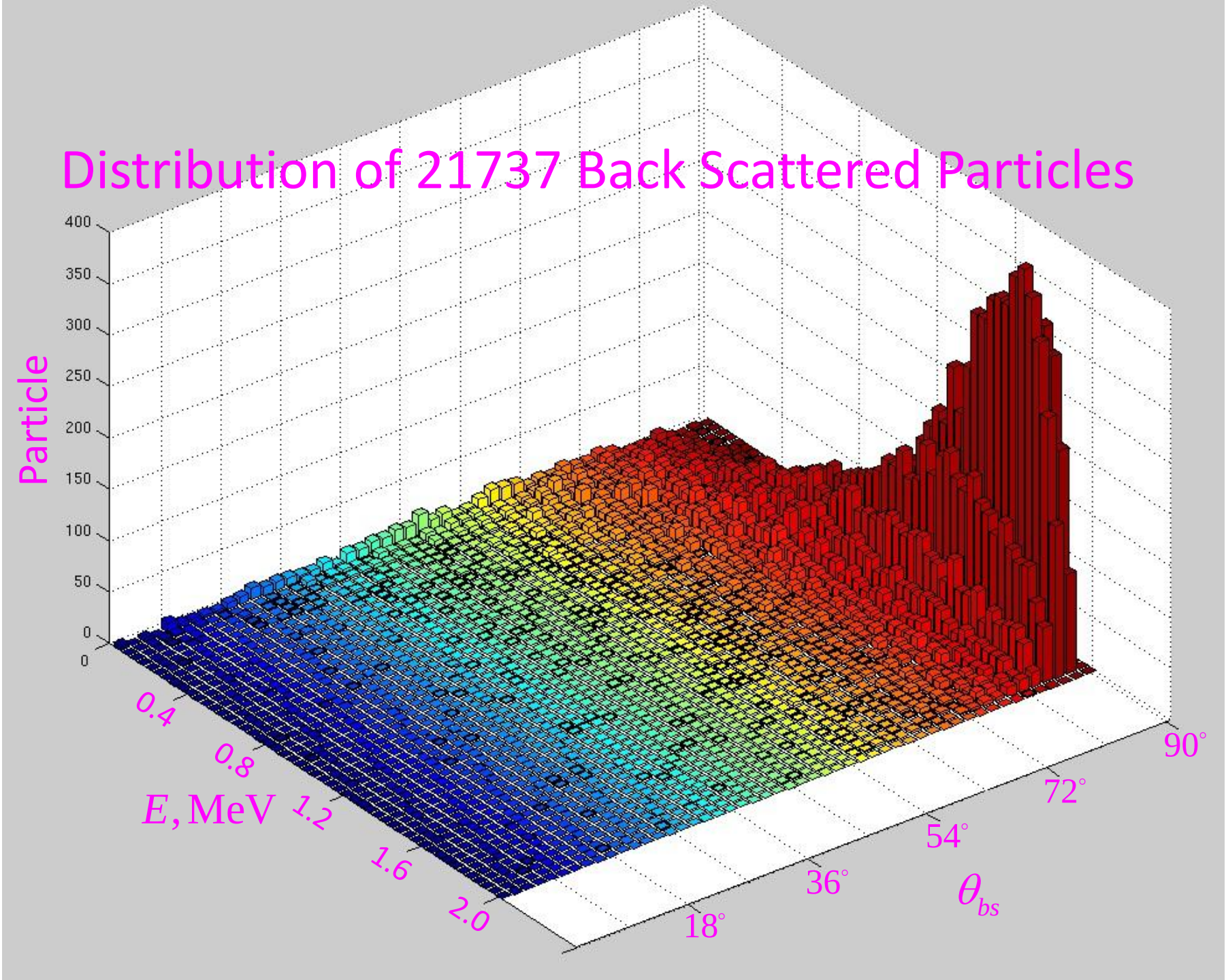


Along the direction of the "reflected" beam

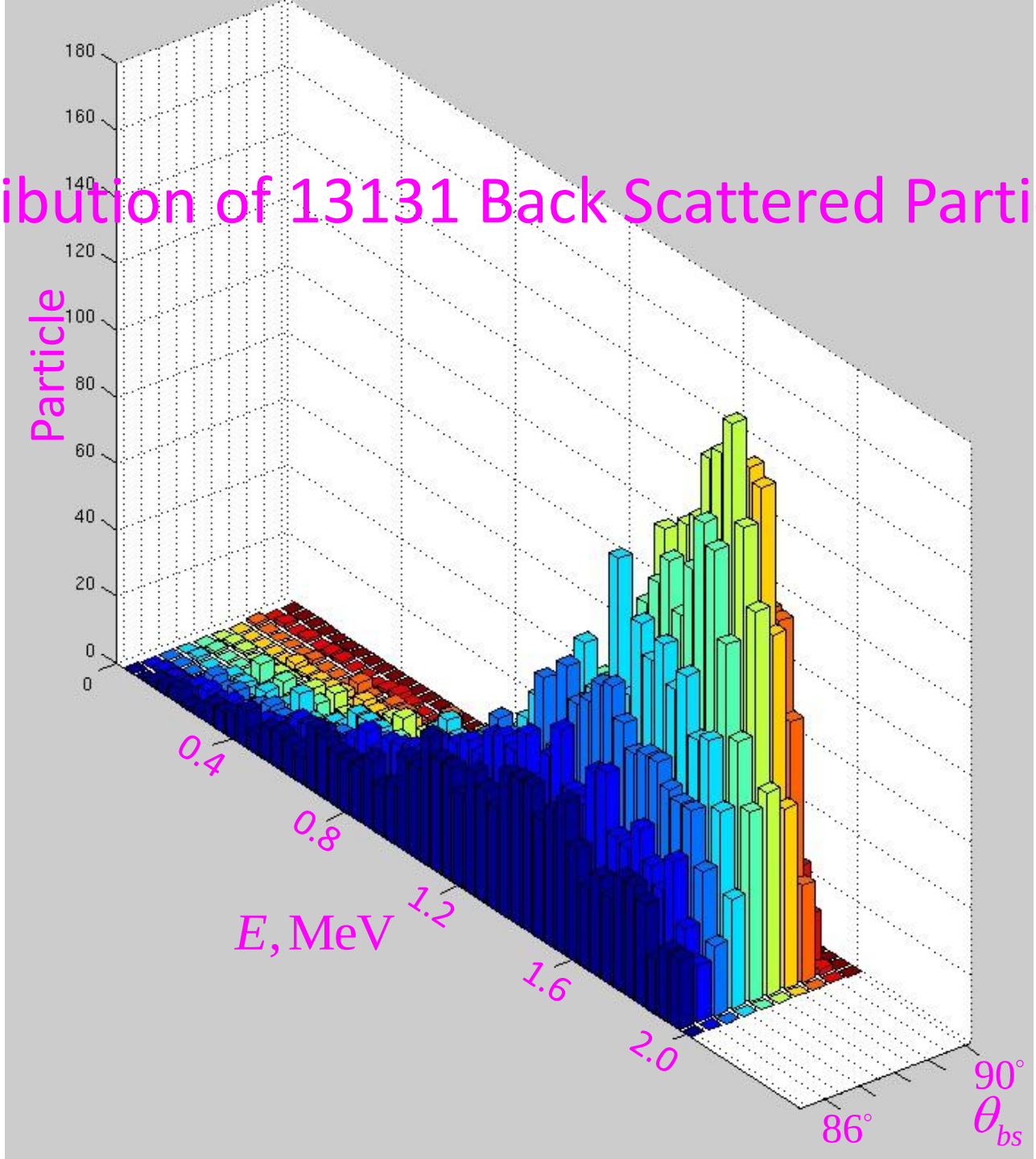
Direction across the "reflected" beam



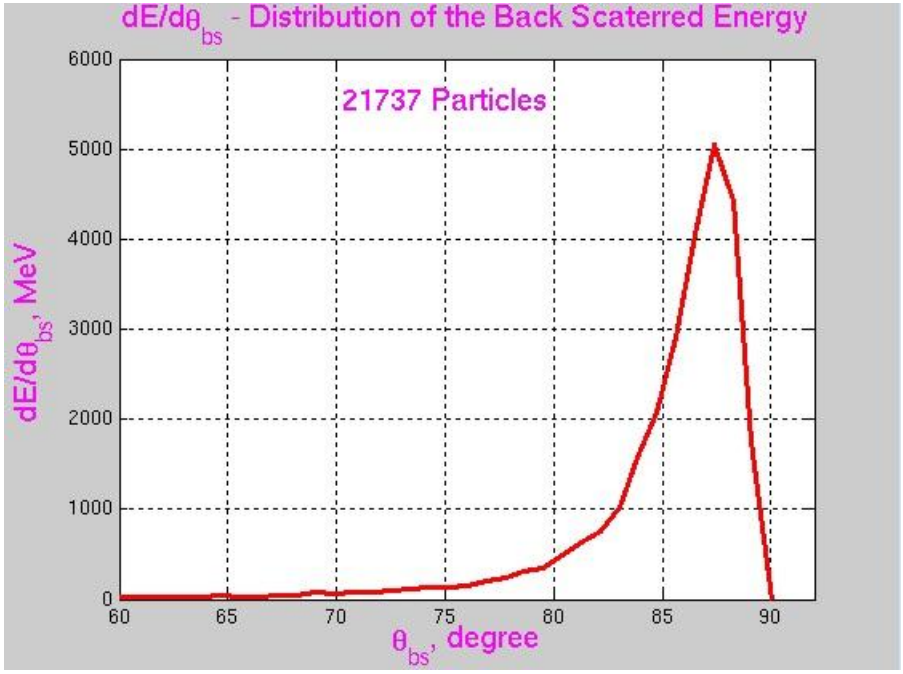


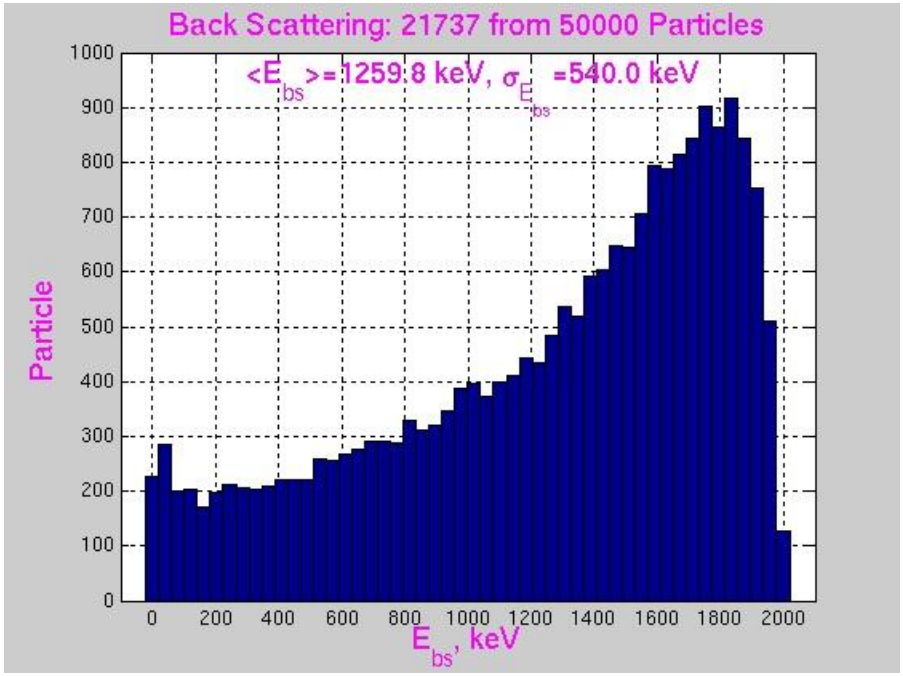

Distribution of 21737 Back Scattered Particles
Particle
400
350
300
250
200
150
100
50
0
0
0.4
0.8
1.2
1.6
2.0
E, MeV
18°
36°
54°
72°
90°
θbs

Distribution of 13131 Back Scattered Particles



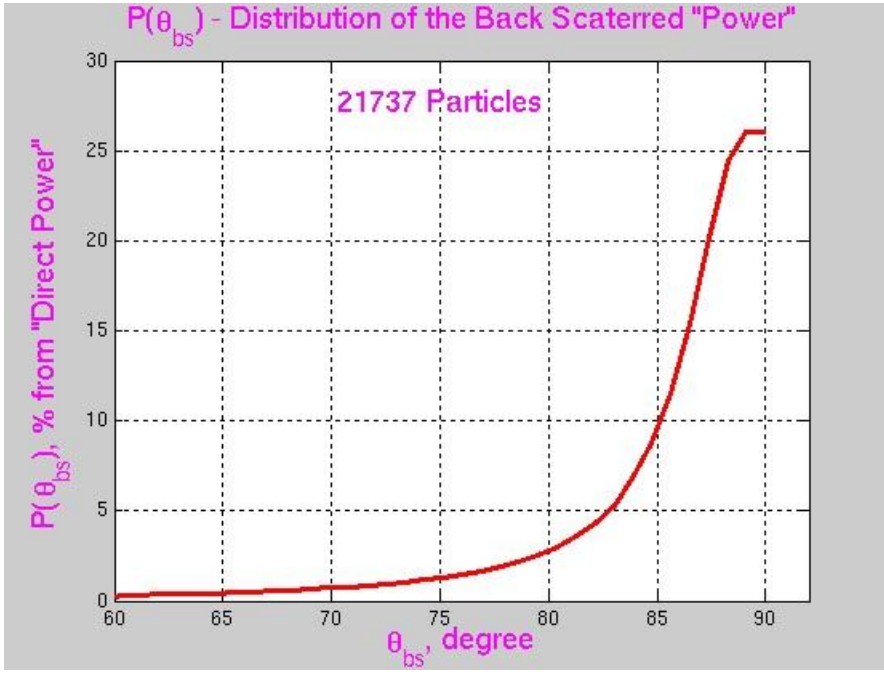
Energy Characteristics of the Back Scattered Particles



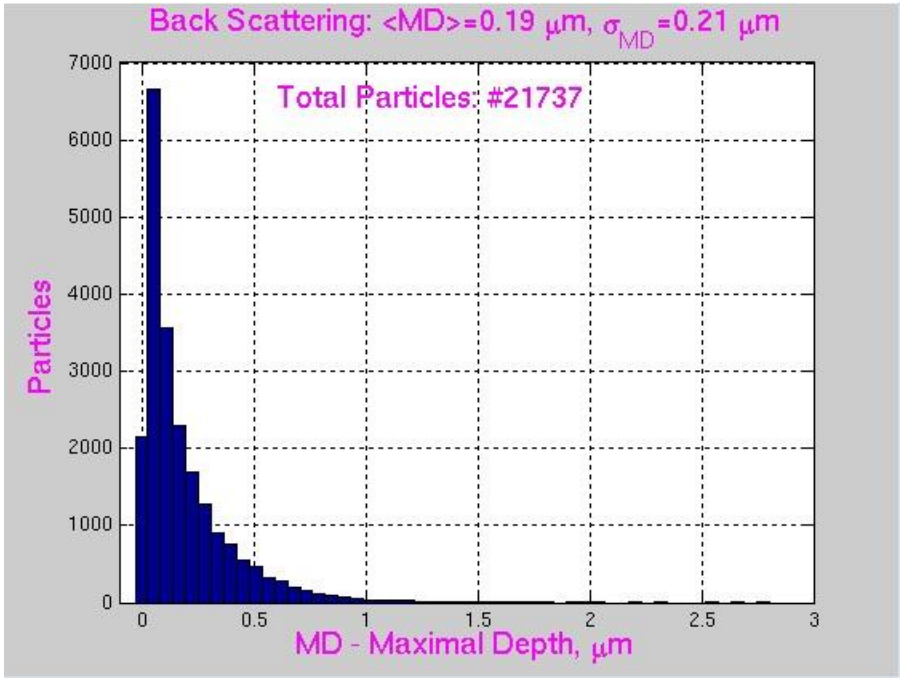


$$P(\theta_{bs}) = \frac{1}{P_{Direct}} \int_0^{\theta_{bs}} \frac{dE(\theta')}{d\theta'_{bs}} d\theta',$$

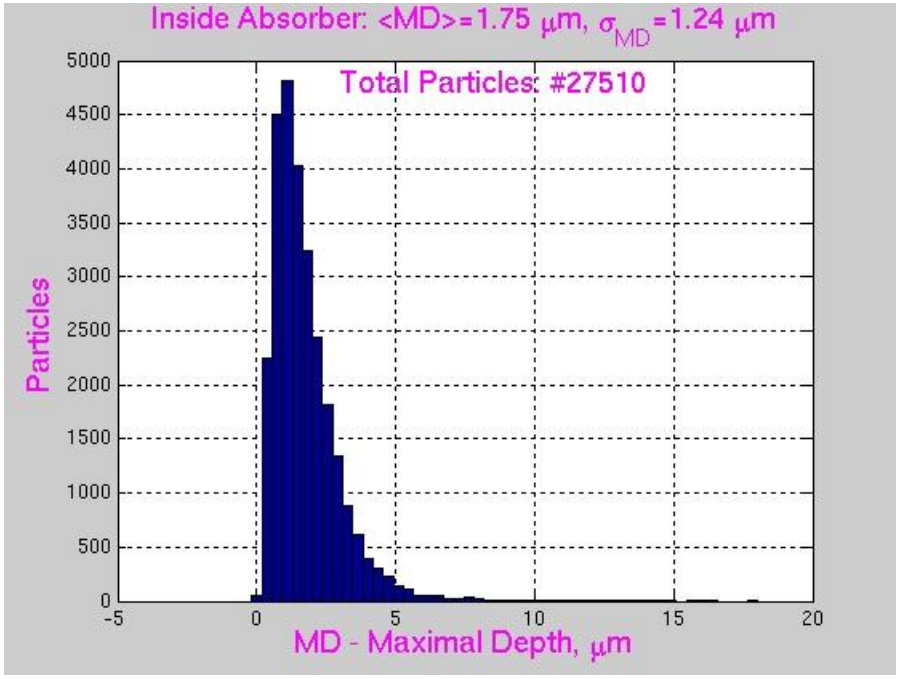
where $P_{Direct} = \sum_{\text{all incident paricles}} E_i$.

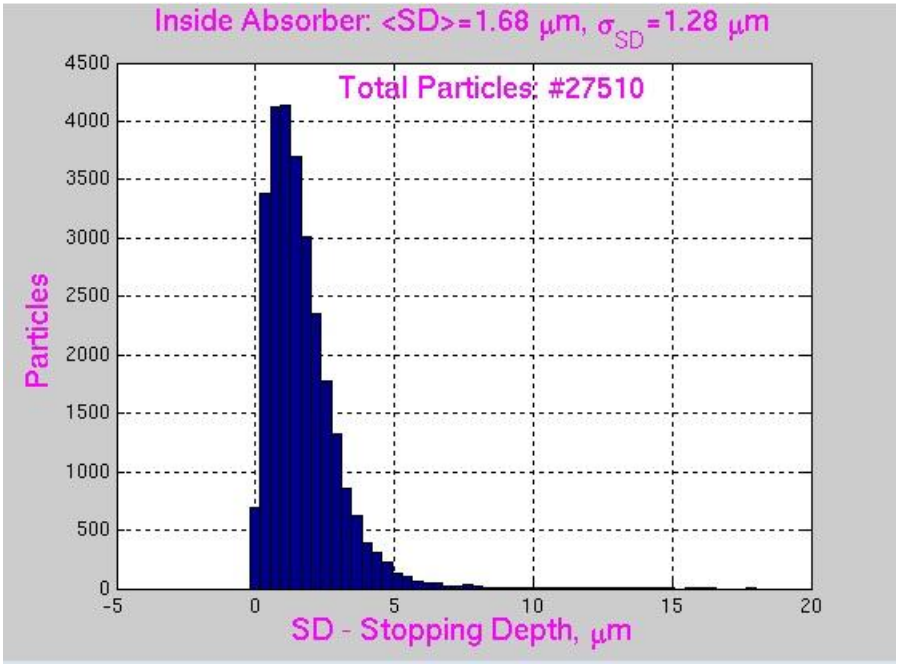


Penetration of the Back Scattered Particles to the Absorber



Penetration of the "Direct" Particles to the Absorber





Comparison of the penetration to the absorber of incident and back scattered particles