

Scattering Angle Error

Hydrogen Target :

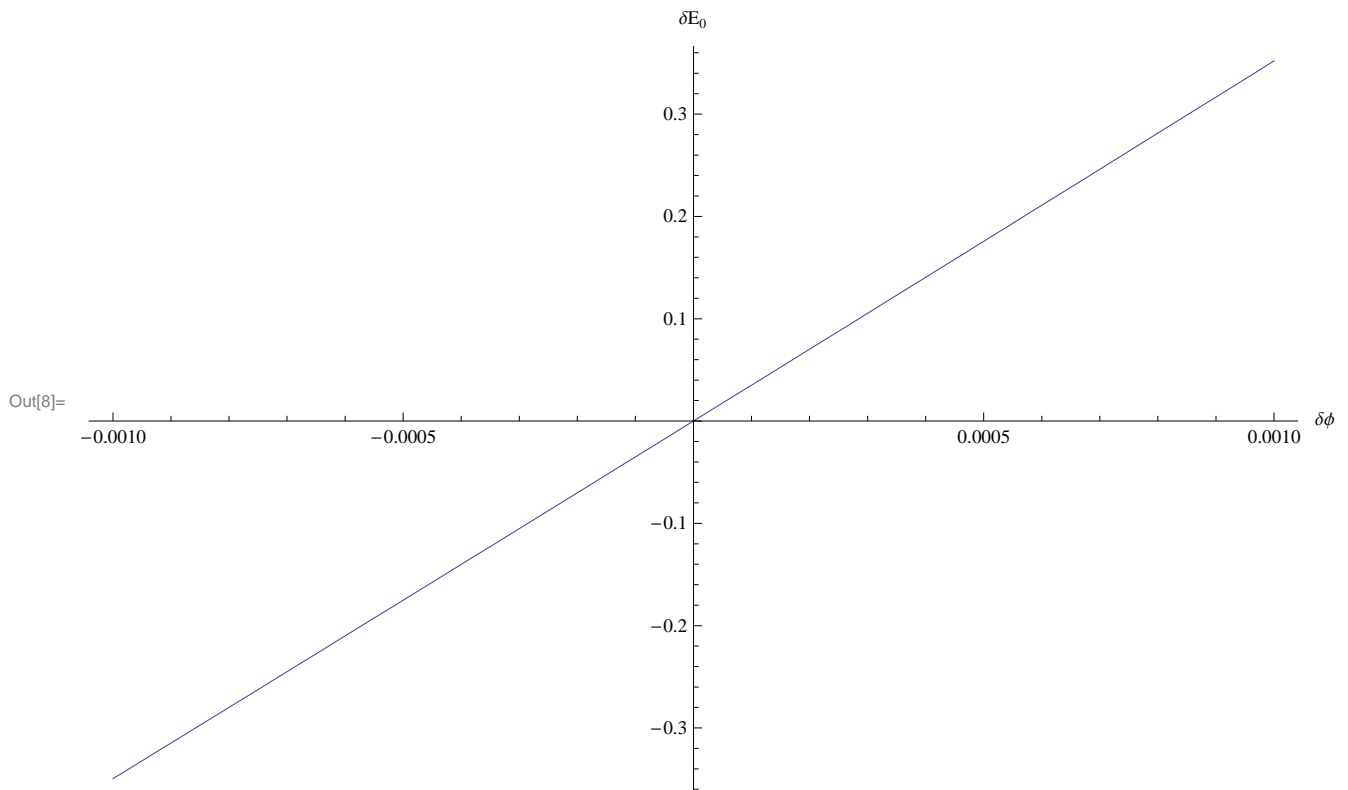
$$\text{In[1]:= } D\left[\frac{E_0}{1 + \frac{E_0}{M}(1 - \cos[\theta + \theta_0])}, \theta\right]$$

$$\text{Out[1]= } -\frac{E_0^2 \sin[\theta + \theta_0]}{M \left(1 + \frac{E_0(1 - \cos[\theta + \theta_0])}{M}\right)^2}$$

$$\text{In[5]:= } \frac{E_0^2 \sin[\theta + \theta_0]}{M \left(1 + \frac{E_0(1 - \cos[\theta + \theta_0])}{M}\right)^2} /. \left\{M \rightarrow 938.27, \theta_0 \rightarrow \frac{\pi}{180.0} * 14.5, \theta \rightarrow 0, E_0 \rightarrow 1193\right\}$$

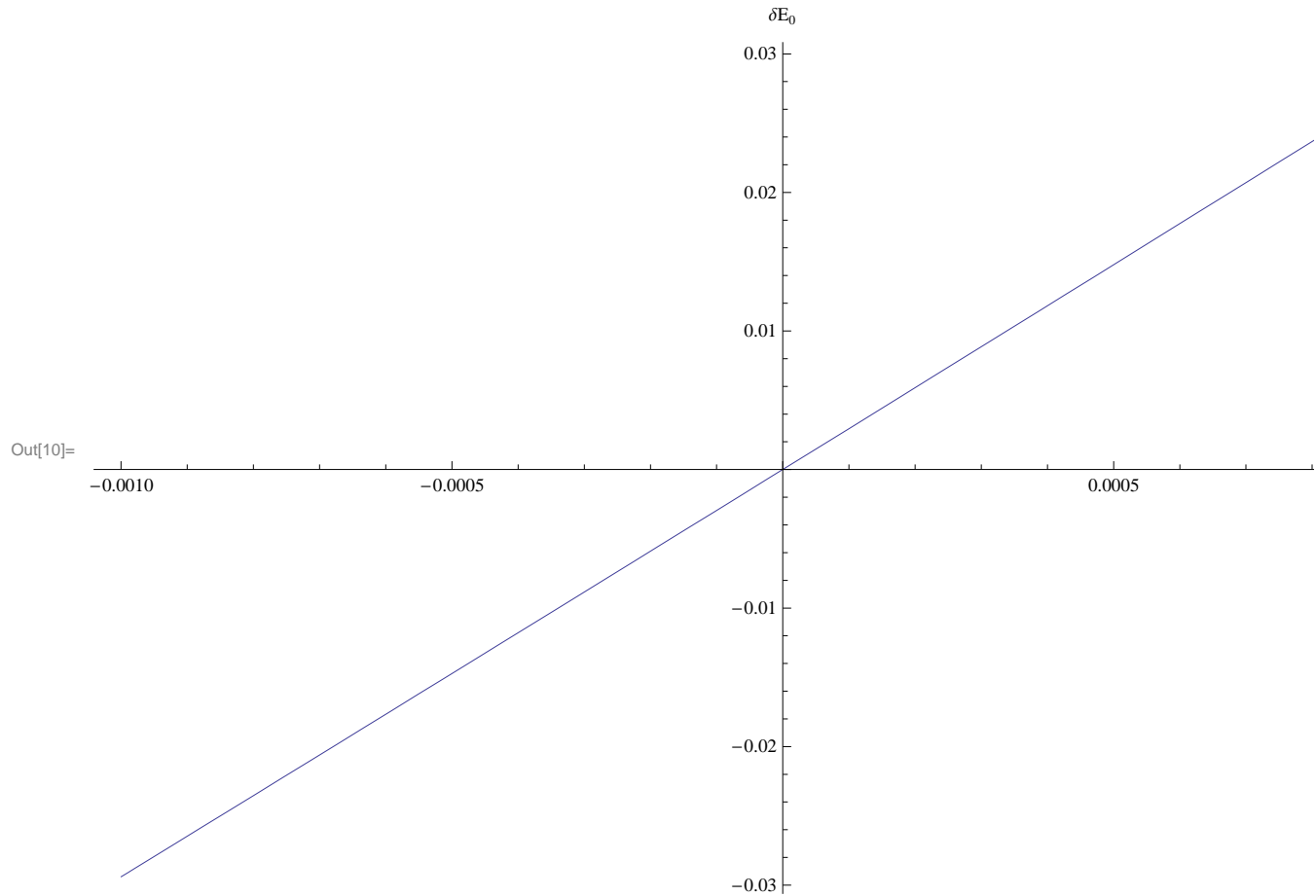
Out[5]= 350.807

$$\text{In[8]:= } \text{Plot}\left[\frac{E_0^2 \sin[\theta + \theta_0]}{M \left(1 + \frac{E_0(1 - \cos[\theta + \theta_0])}{M}\right)^2} \theta /. \left\{M \rightarrow 938.27, \theta_0 \rightarrow \frac{\pi}{180.0} * 14.5, E_0 \rightarrow 1193\right\}, \right. \\ \left. \{\theta, -0.001, .001\}, \text{AxesLabel} \rightarrow \{\text{"}\delta\phi\text{"}, \text{"}\delta E_0\text{"}\}\right]$$



Carbon Target :

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In[10]:= Plot[ $\frac{E_0^2 \sin[\theta + \theta_0]}{M \left(1 + \frac{E_0 (1 - \cos[\theta + \theta_0])}{M}\right)^2} \theta /. \{M \rightarrow 12000, \theta_0 \rightarrow \frac{\pi}{180.0} * 14.5, E_0 \rightarrow 1193\},$ 
  {\theta, -0.001, .001}, AxesLabel -> {"\delta\phi", "\delta E_0"}]
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Tantalum Target :

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In[11]:= Plot[
$$\frac{E_0^2 \sin[\theta + \theta_0]}{M \left(1 + \frac{E_0 (1 - \cos[\theta + \theta_0])}{M}\right)^2} \theta /. \{M \rightarrow 180000, \theta_0 \rightarrow \frac{\pi}{180.0} * 14.5, E_0 \rightarrow 1193\},$$


$$\{\theta, -0.001, .001\}, \text{AxesLabel} \rightarrow \{\delta\phi, \delta E_0\}]$$

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