

Gemini++

- Initial conditions
 1. Z of the compound nucleus
 2. A of the compound nucleus
 3. Excitation Energy (MeV)

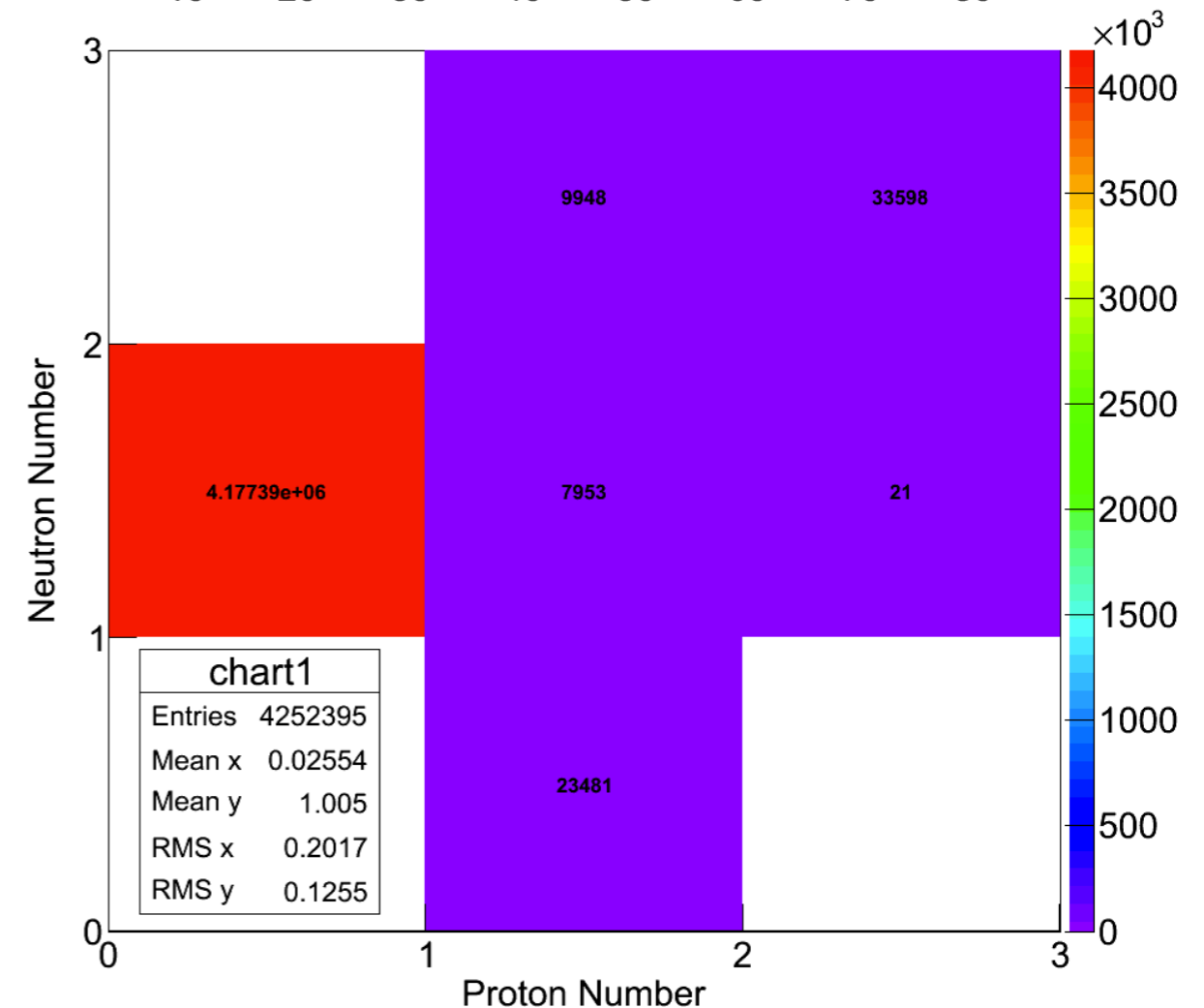
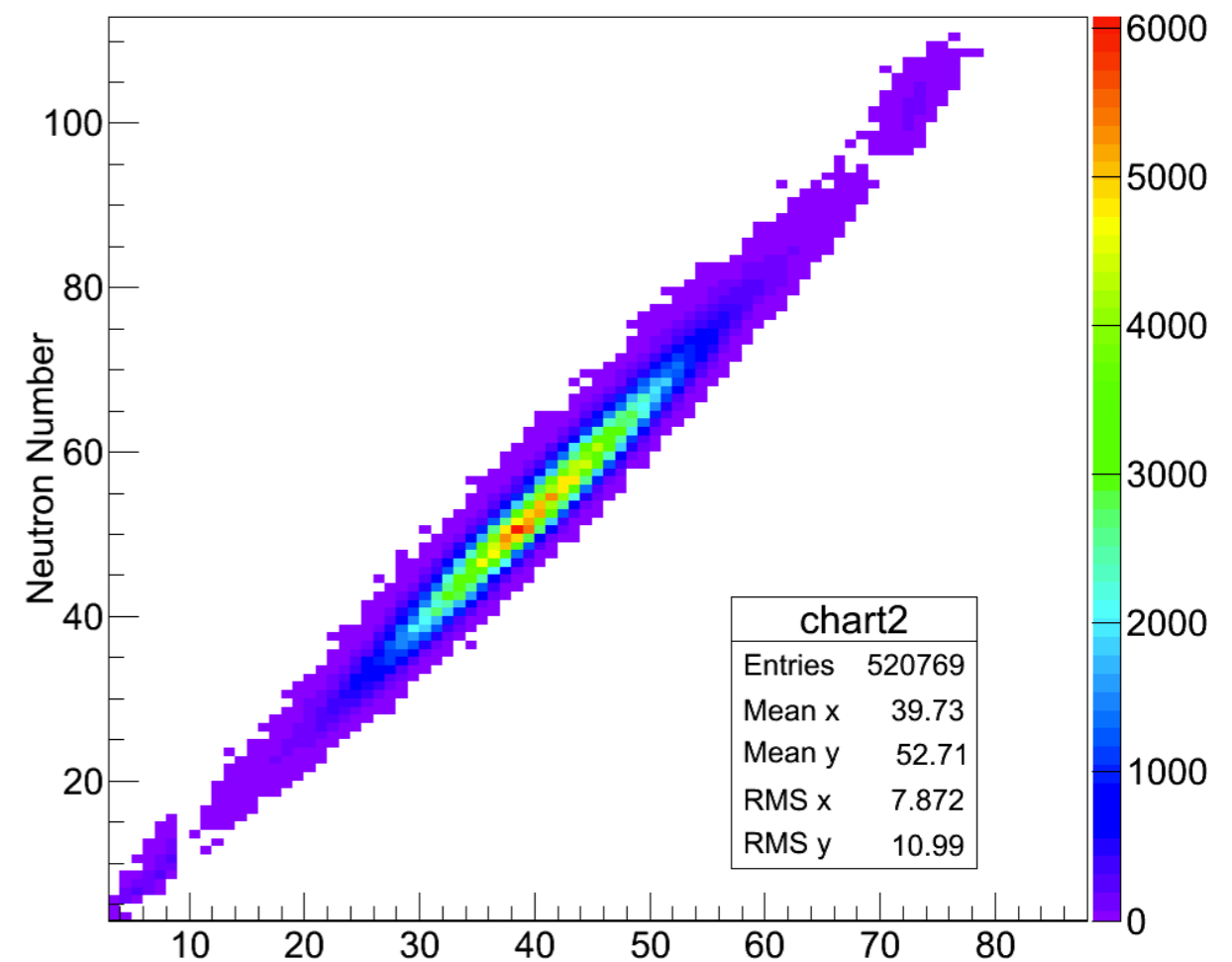
$$E_{\text{excite}} = \frac{A_p A_t}{A_p + A_t} E_{\text{lab}} + Q(\text{Q-value})$$

4. Spin J (??) (\hbar)
5. Spin Axis
6. Velocity (cm/ns)

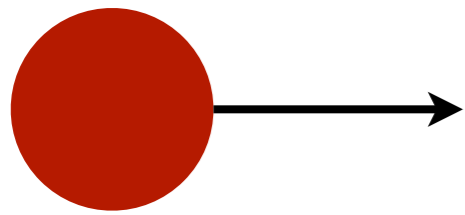
- Kris' suggestion

1. Z = 80
2. A = 202
3. $E_{\text{excite}} = 200$ MeV
4. $J = 100 \hbar$
5. z-axis
6. 0

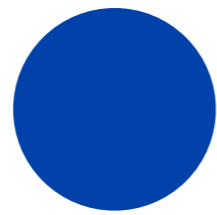
260k events



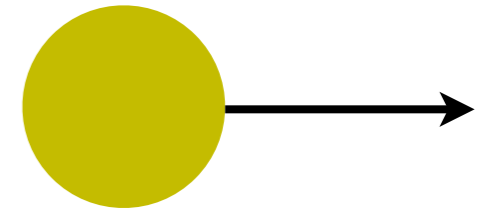
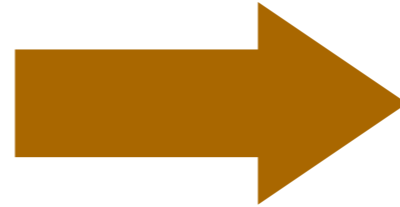
Gemini++



Projectile
20 MeV/u



Target
at rest



Compound Nucleus
~5 MeV/u

$$p_p^\mu = (E_1, 0, 0, \mathbf{p}_1)$$

$$p_t^\mu = (E_2, 0, 0, 0)$$

$$p_{\text{CN}}^\mu = (E_3, 0, 0, \mathbf{p}_3)$$

$$E = \gamma mc^2$$

$$\mathbf{p} = \gamma mc\boldsymbol{\beta}$$

Energy Conservation

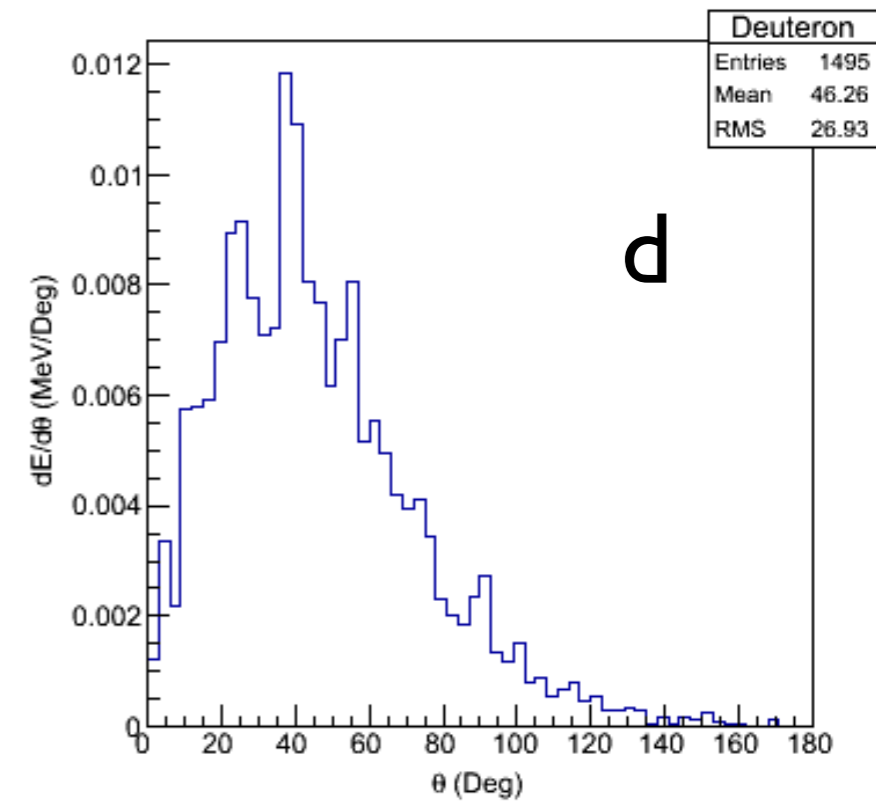
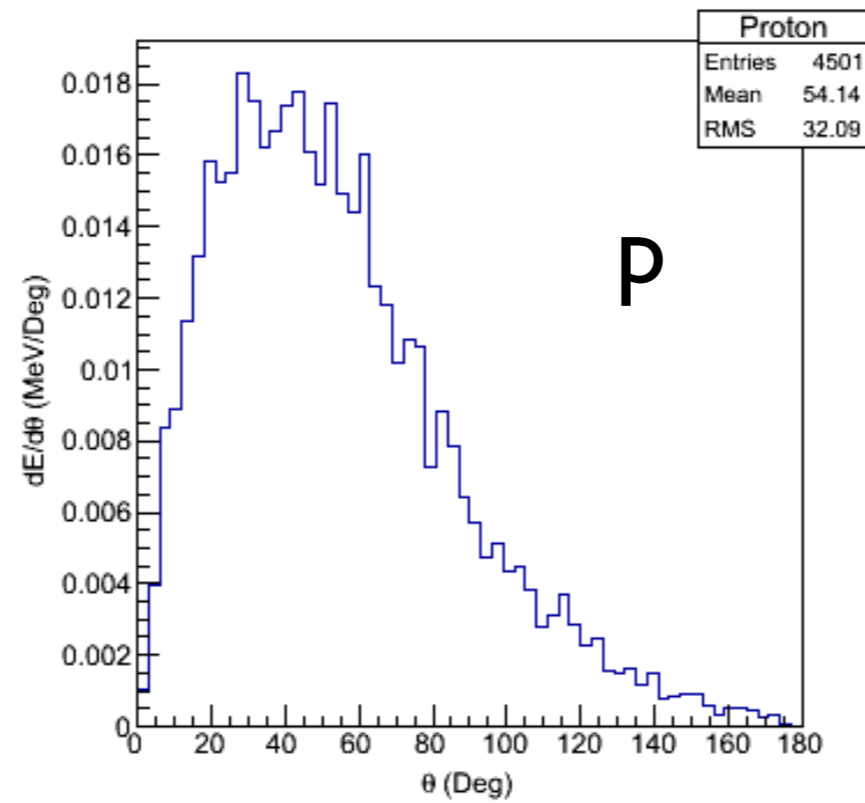
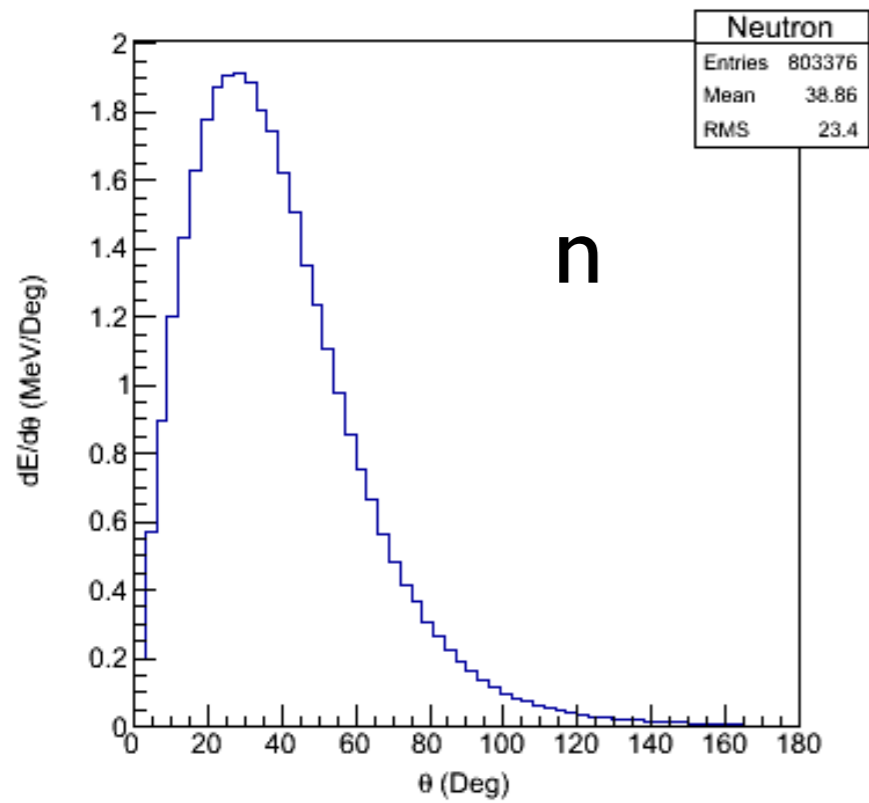
$$E_1 + E_2 = E_3$$

Momentum Conservation

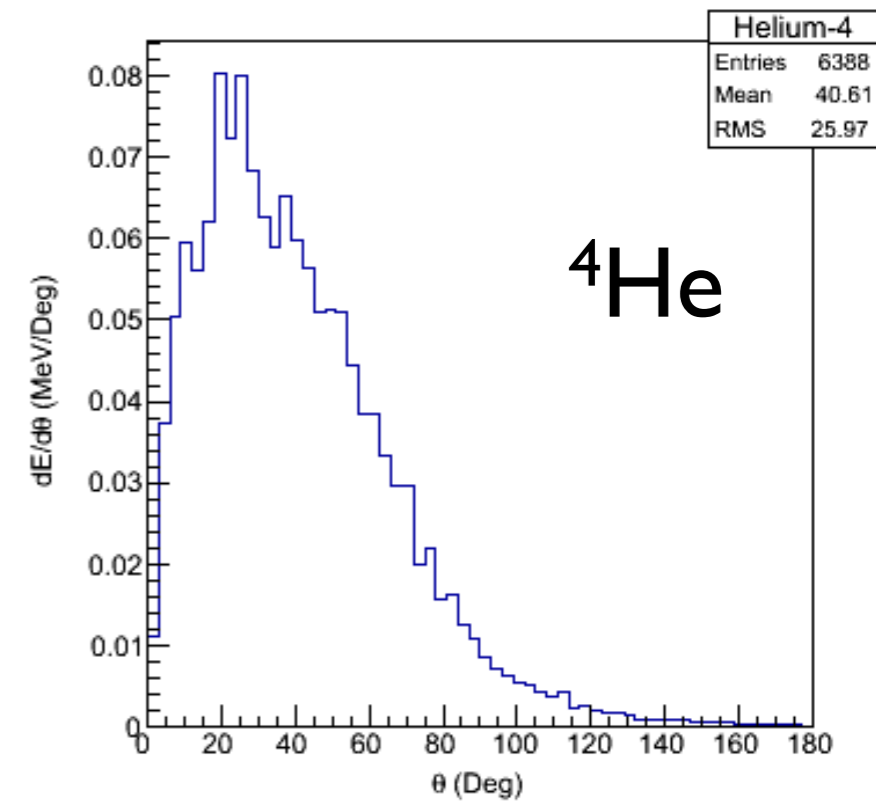
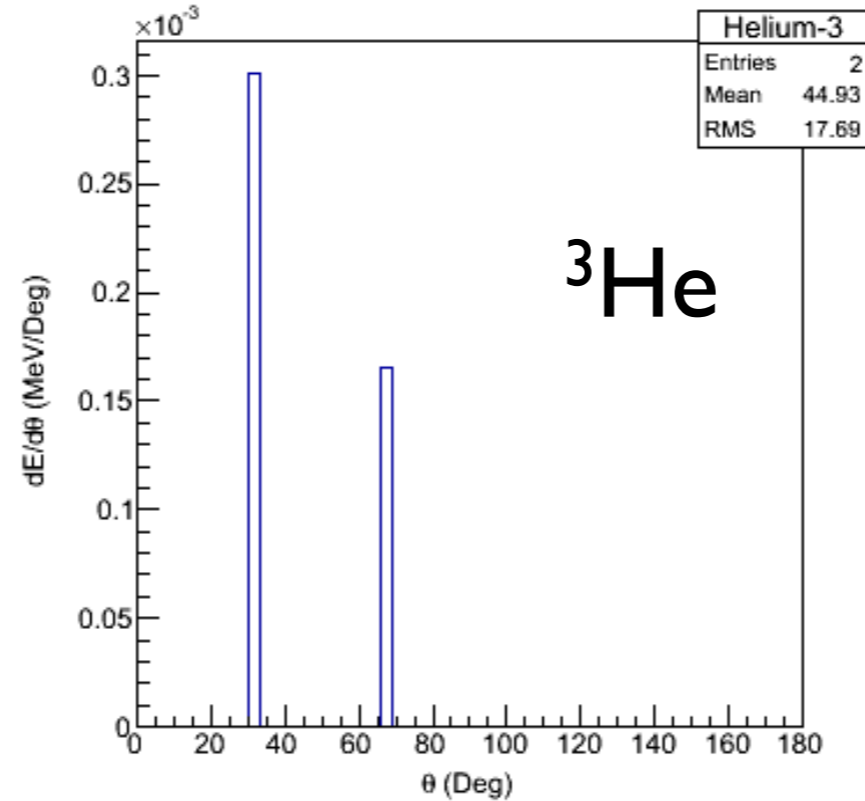
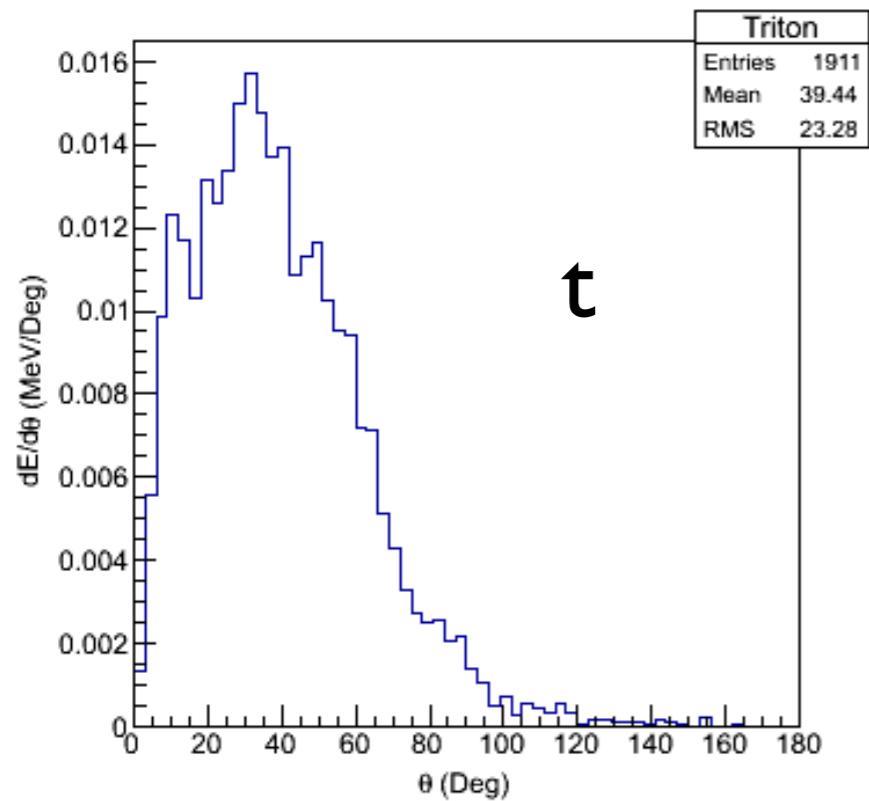
$$\mathbf{p}_1 = \mathbf{p}_3$$

$$\therefore \beta_3 = \frac{\gamma_1 \beta_1}{\gamma_1 + 1}$$

Gemini++ - $dE/d\theta$ vs. θ

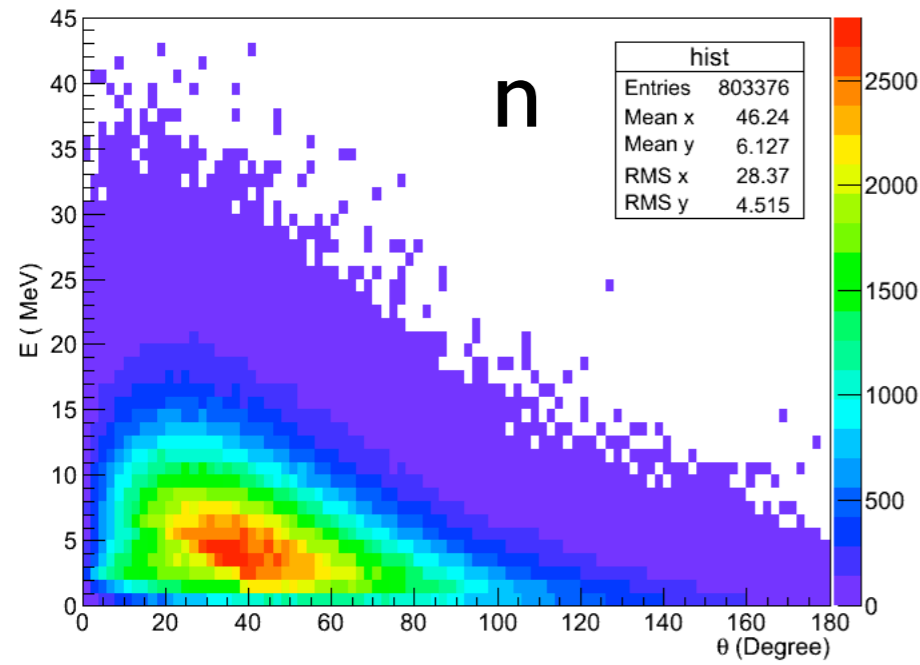


50k events

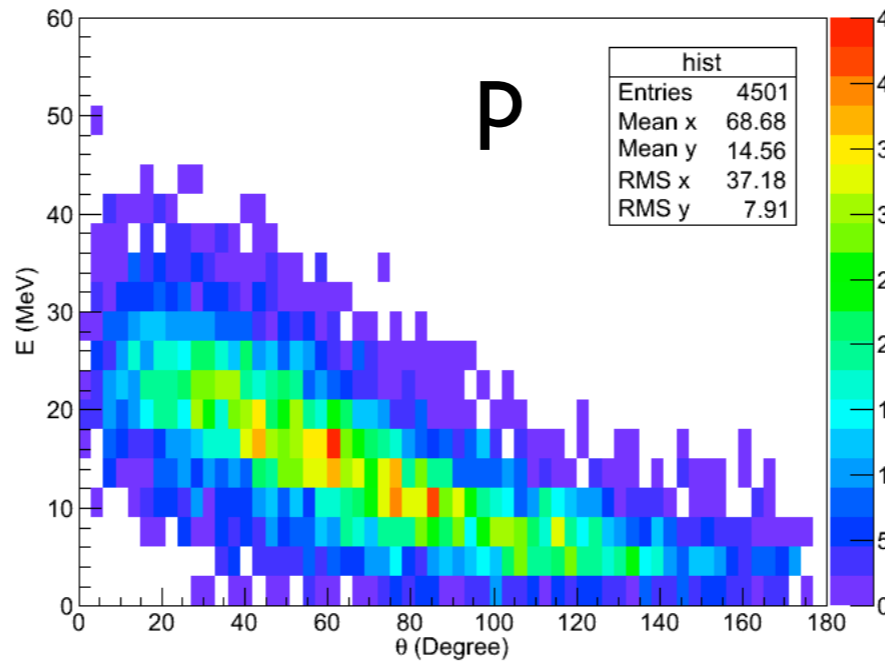


Gemini++ - Energy Spectra

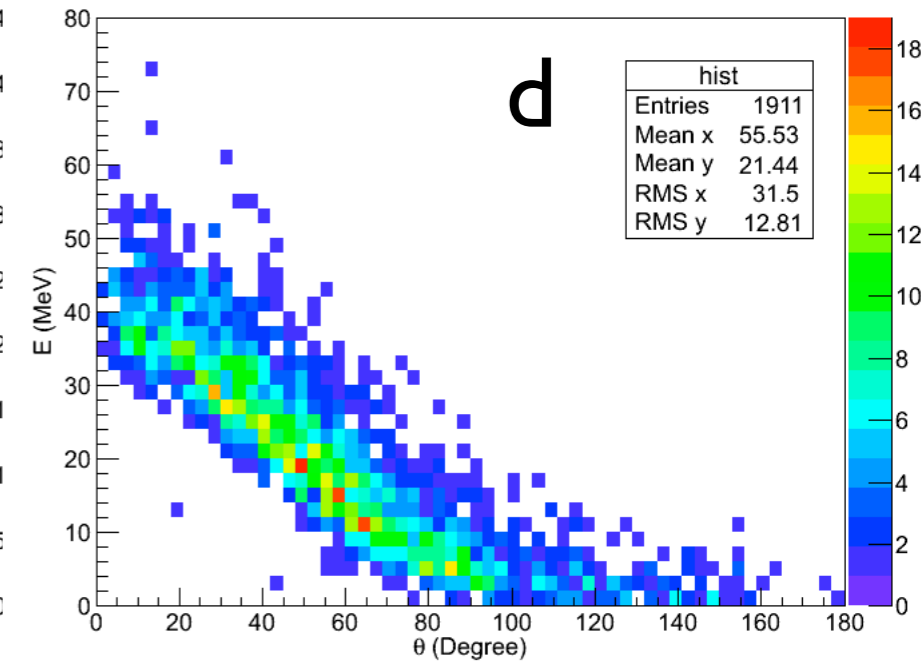
KE:theta {Nnum==1&&Znum==0}



KE:theta {Nnum==0&&Znum==1}

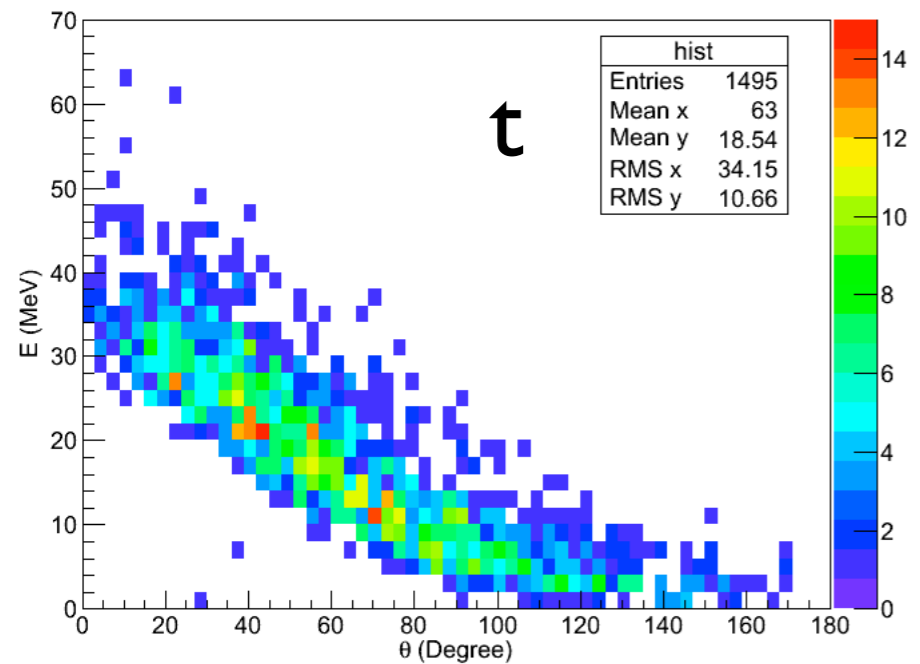


KE:theta {Nnum==2&&Znum==1}

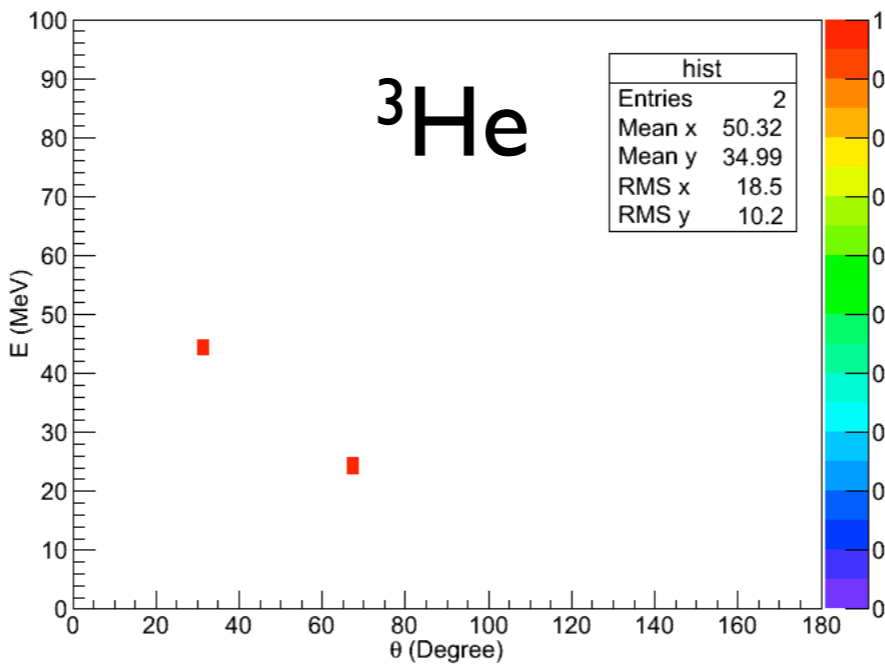


50k events

KE:theta {Nnum==1&&Znum==1}



KE:theta {Nnum==1&&Znum==2}



KE:theta {Nnum==2&&Znum==2}

