Gemini++

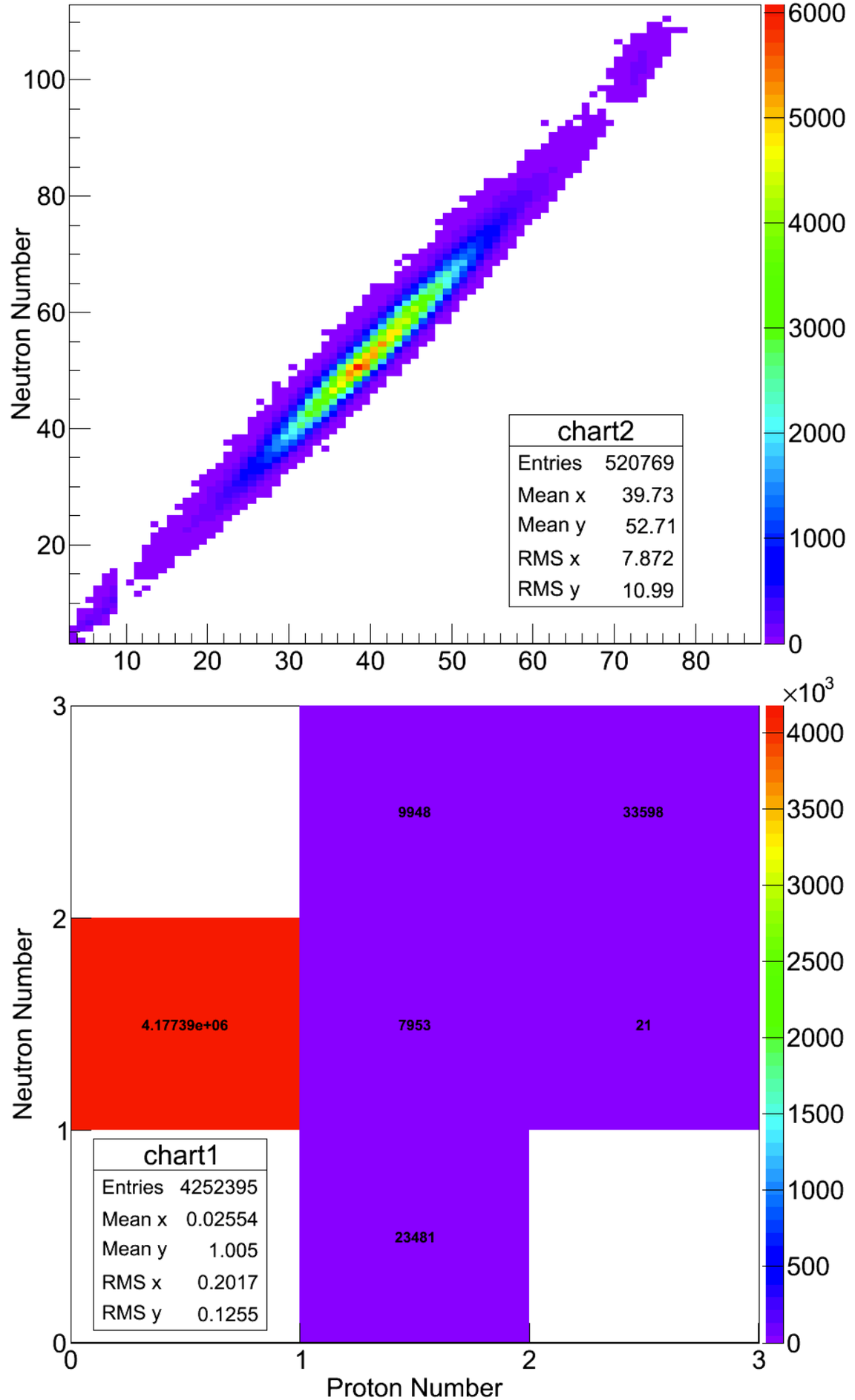
- Initial conditions
  1. Z of the compound nucleus
  2. A of the compound nucleus
  3. Excitation Energy (MeV)

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

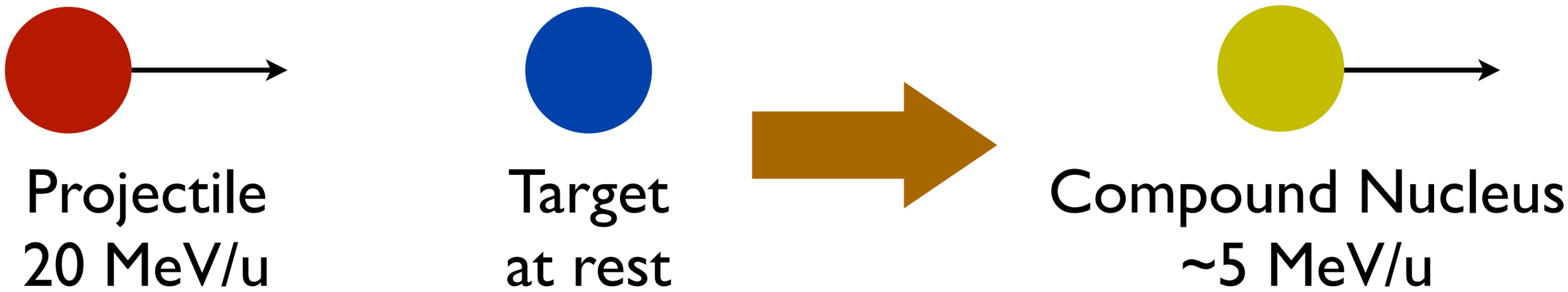
  4. Spin J (??) ($\hbar$)
  5. Spin Axis
  6. Velocity (cm/ns)

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

260k events



Gemini++



$p_p^\mu = (E_1, 0, 0, \mathbf{p}_1)$ $p_t^\mu = (E_2, 0, 0, 0)$ $p_{\mathrm{CN}}^\mu = (E_3, 0, 0, \mathbf{p}_3)$

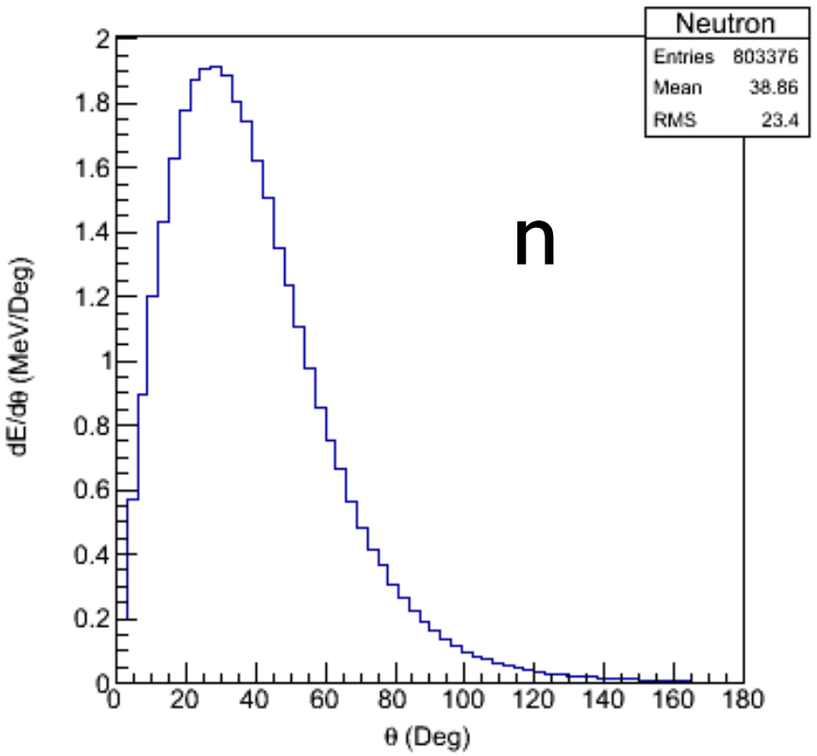
$$E = \gamma m c^2$$
$$\mathbf{p} = \gamma m c \boldsymbol{\beta}$$

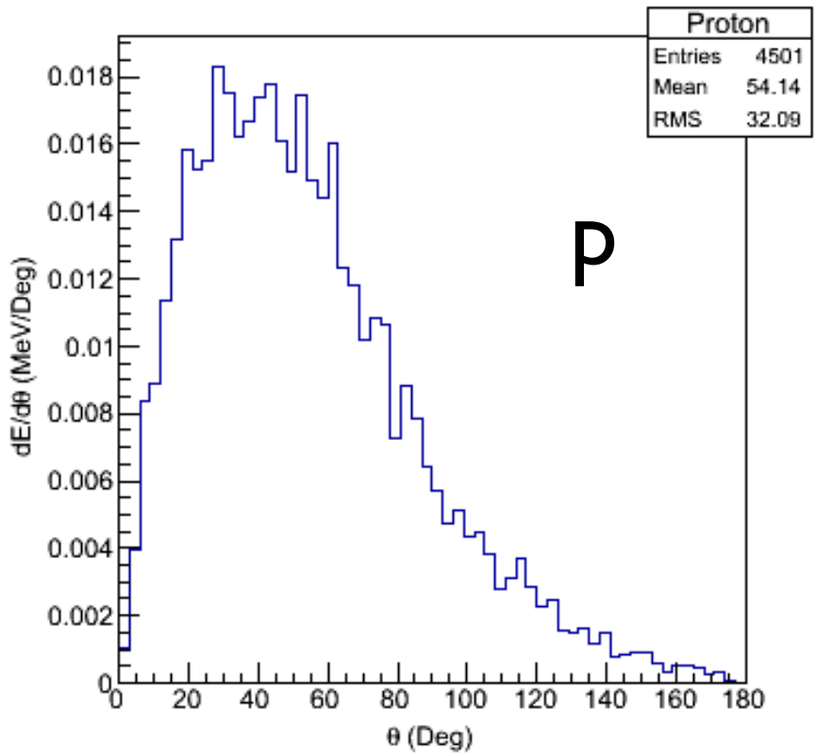
Energy Conservation $E_1 + E_2 = E_3$

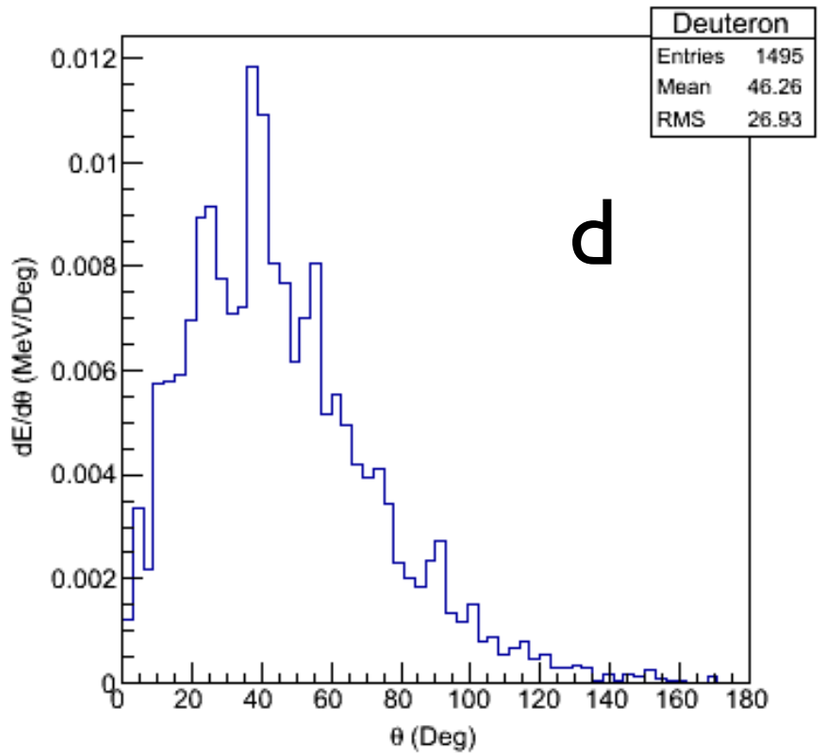
Momentum Conservation $\mathbf{p}_1 = \mathbf{p}_3$

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

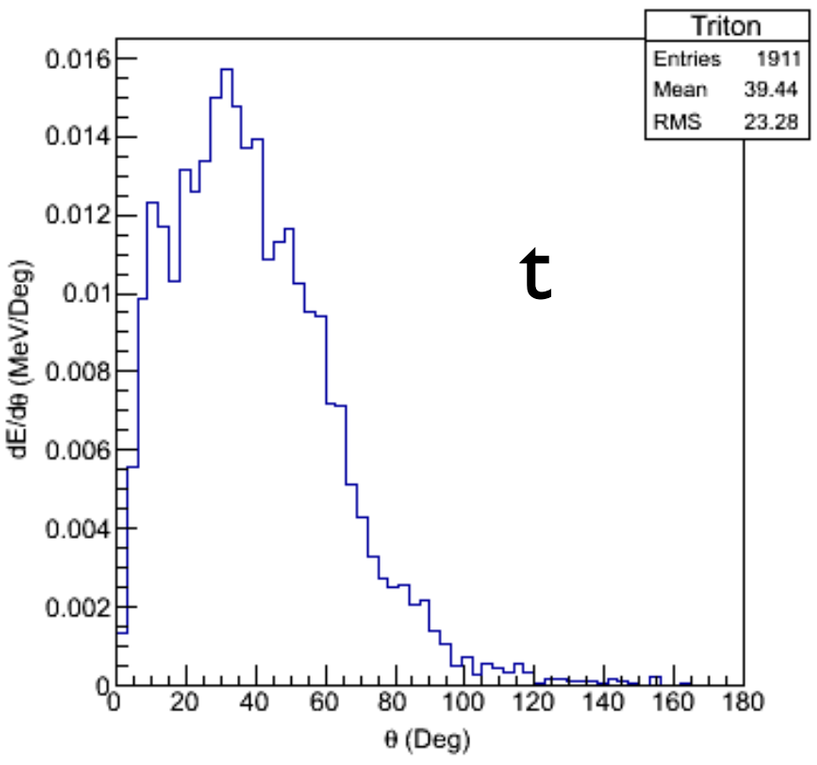
Gemini++ - dE/dθ vs. θ

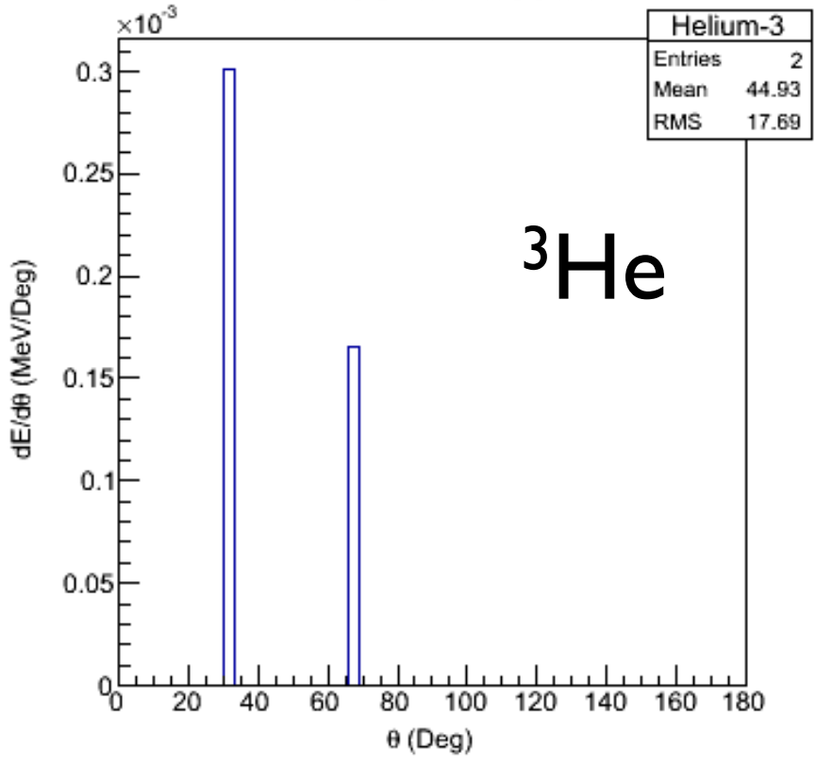


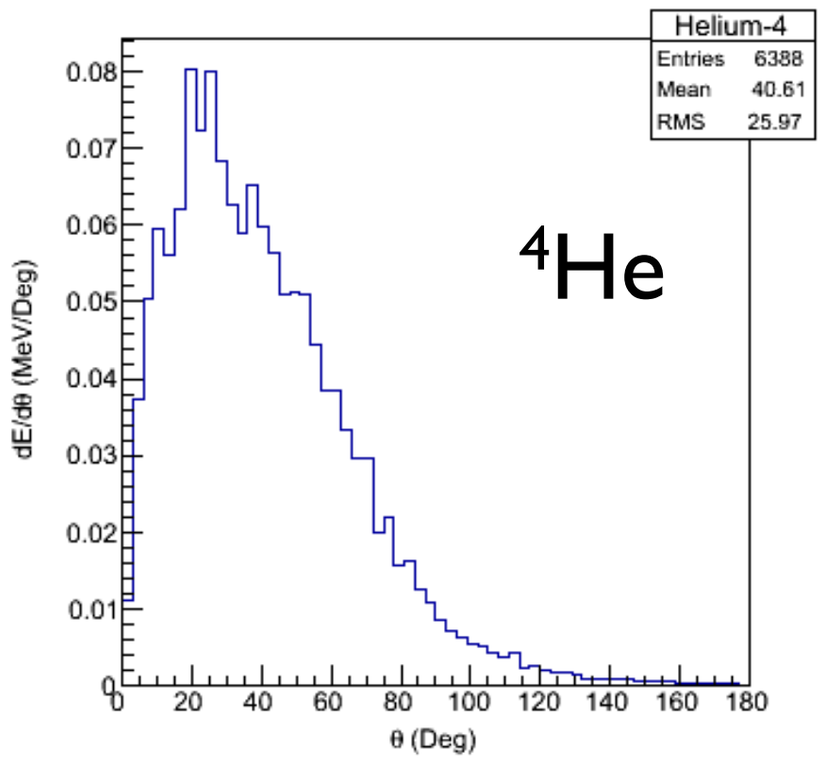




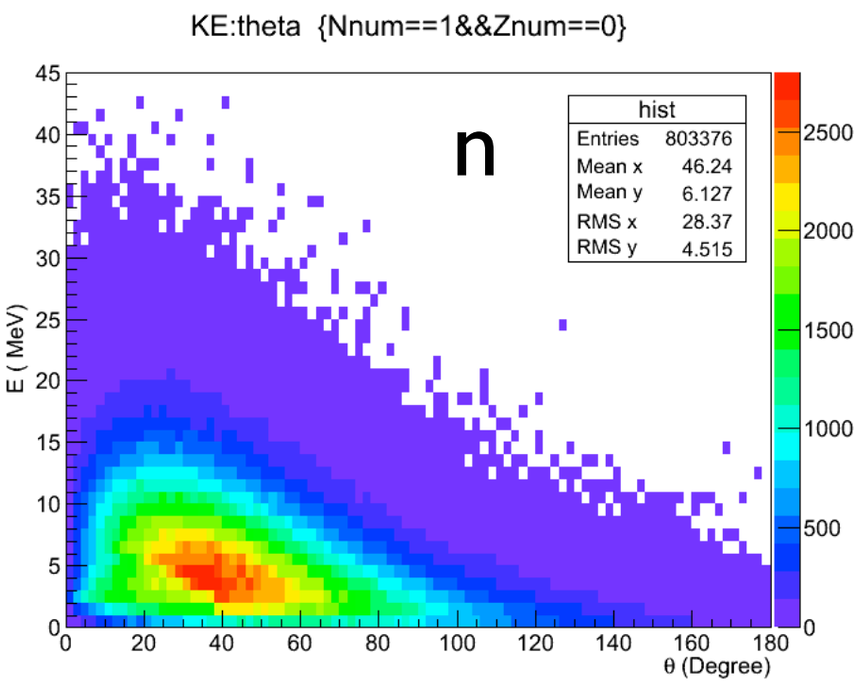
50k events

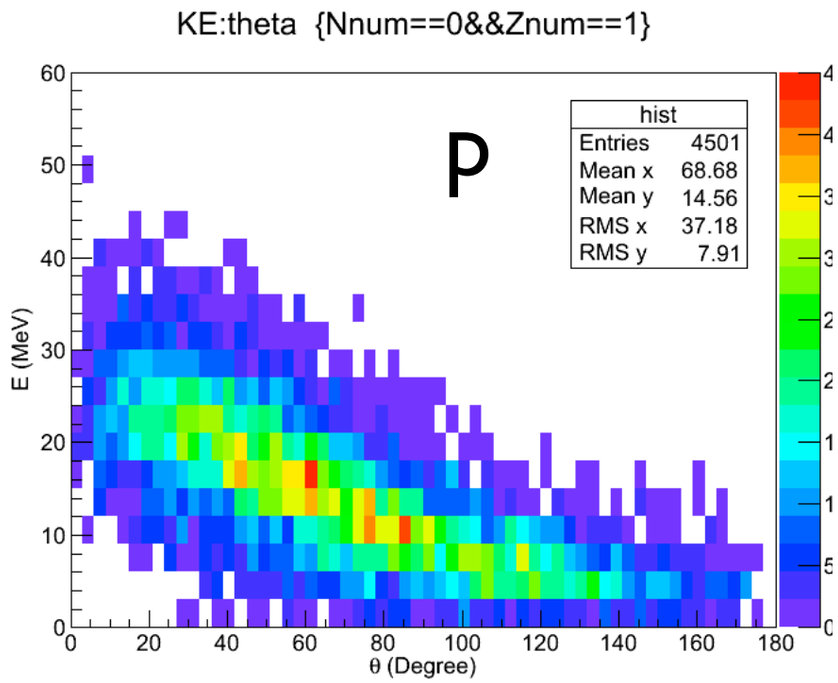


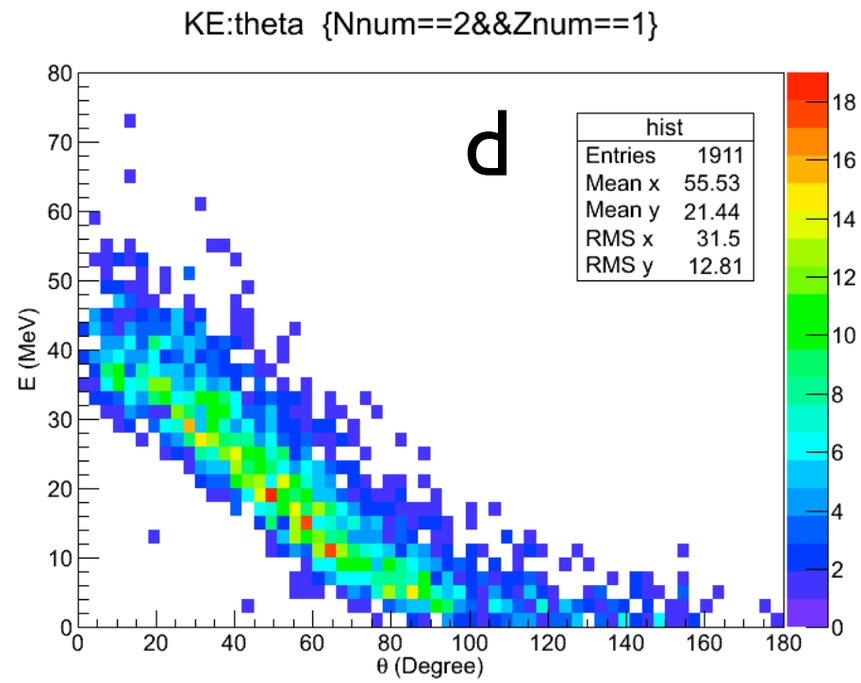




Gemini++ - Energy Spectra







50k events