Measurement of the Neutron Magnetic Form Factor G_M^n at High Q^2 Using the Ratio Method on Deuteron

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Motivation : Fundamental quantity related to the magnetization in the nucleon.

Method : Extract G_M^n using ratio techniques: $R = \frac{d(e,e'n)p}{d(e,e'p)n}$

Required : Precise determination of the neutron detection efficiency (NDE) using $p(e, e'\pi^+ n)$ reaction on hydrogen target in Run Group A.

Analysis Status:

- **Production data**: Developed and tested codes to extract R on early DSTs and simulation.
- **NDE(1)**: Optimizing event selection and extracting neutrons from higher mass background.
- **NDE(2)**: (1) Swim expected neutrons from the track vertex to intersect ECAL and (2) then select neutral ECAL hit closest to the expected neutron point-of-intersection. (3) Apply direction cosine cut. See plots to the right.

Neutral mass measured on ECAL