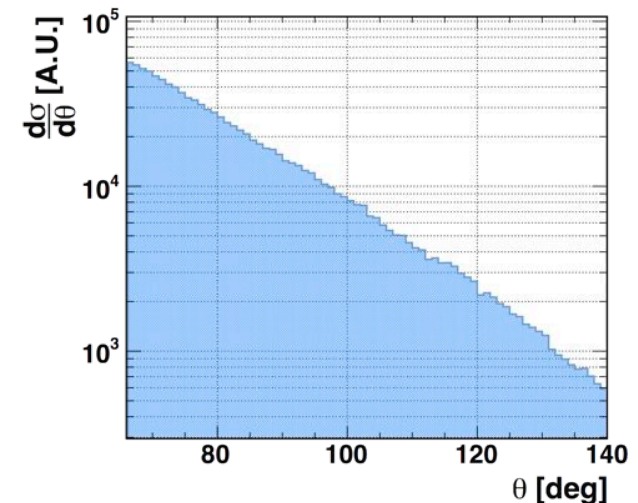
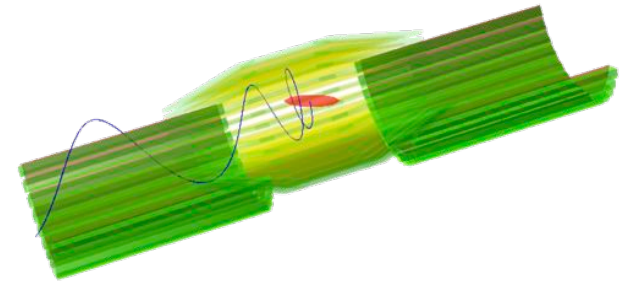


# A dedicated calibration tool for the MEG I and MEG II positron spectrometer

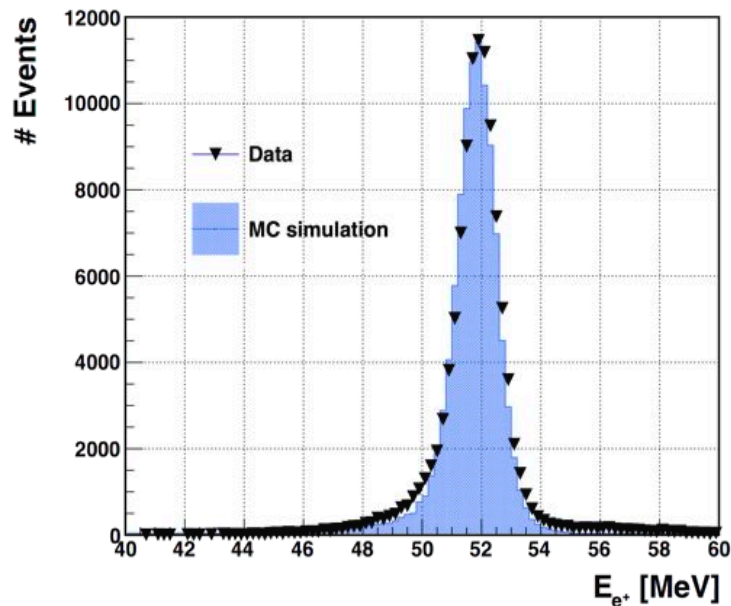
C. Bemporad<sup>1ab</sup>, P. W. Cattaneo<sup>2</sup>, F. Cei<sup>1ab</sup>, P.-R. Kettle<sup>3</sup>, A. Papa<sup>3</sup>, G. Rutar<sup>3,4</sup>



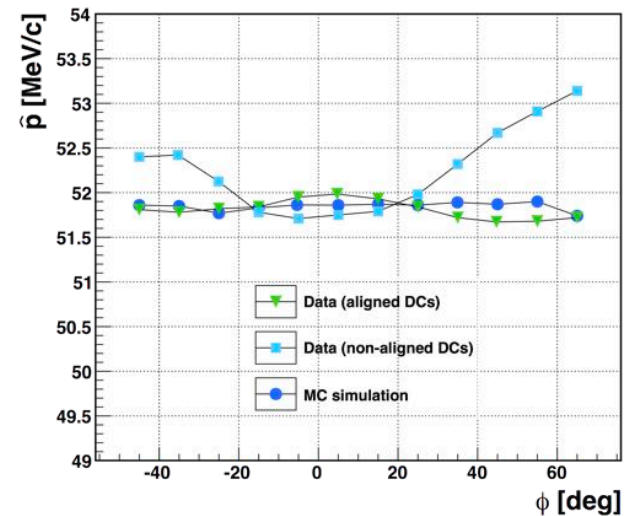
- Calibration methods for the MEG  $e^+$  spectrometer:
  - $e^+$  from Michel decay  $\mu^+ \rightarrow e^+ \nu_e \bar{\nu}_\mu$  (continuous energy spectrum)
  - Cosmic rays (straight  $\mu$  tracks)
  - **NEW:**  $e^+$  beam undergoing Mott scattering
- The Mott scattering calibration method:
  - Instead of using the usual  $\mu^+$  beam, utilize  $e^+$  beam and tune it to momenta around 52 MeV/c ( $\approx$  MEG-signal  $e^+$  momentum)
  - $e^+$  hit MEG target and undergo Mott scattering
  - Well-known Mott scattering cross section has a strong dependence on the scattering angle  $\theta$
  - Outgoing momentum of the  $e^+$  is  $\approx$  equal to initial momentum  $\rightarrow$  energy spectrum is a “monochromatic line”



## “Monochromatic Mott line”



## Check and performance of the Drift Chamber alignment



**Extraction of spectrometer resolutions**  
from tracks which feature two turns in the Drift Chamber system

