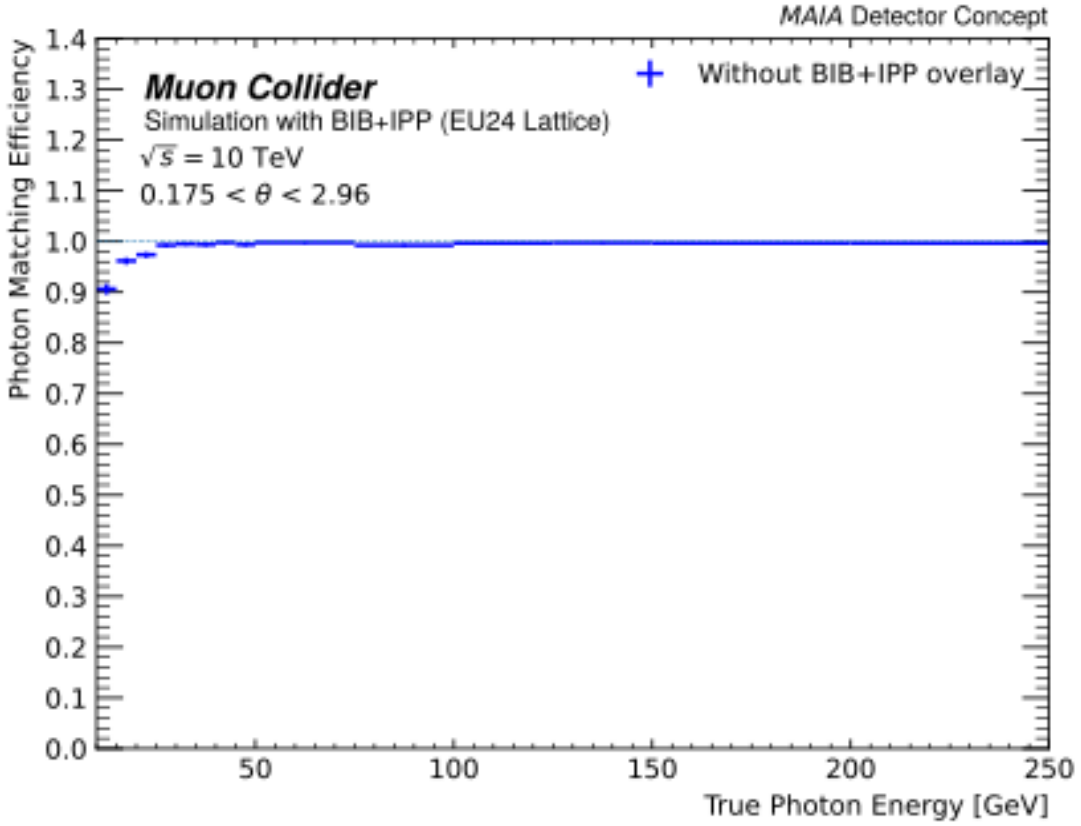
v4 Neutrons and Photons

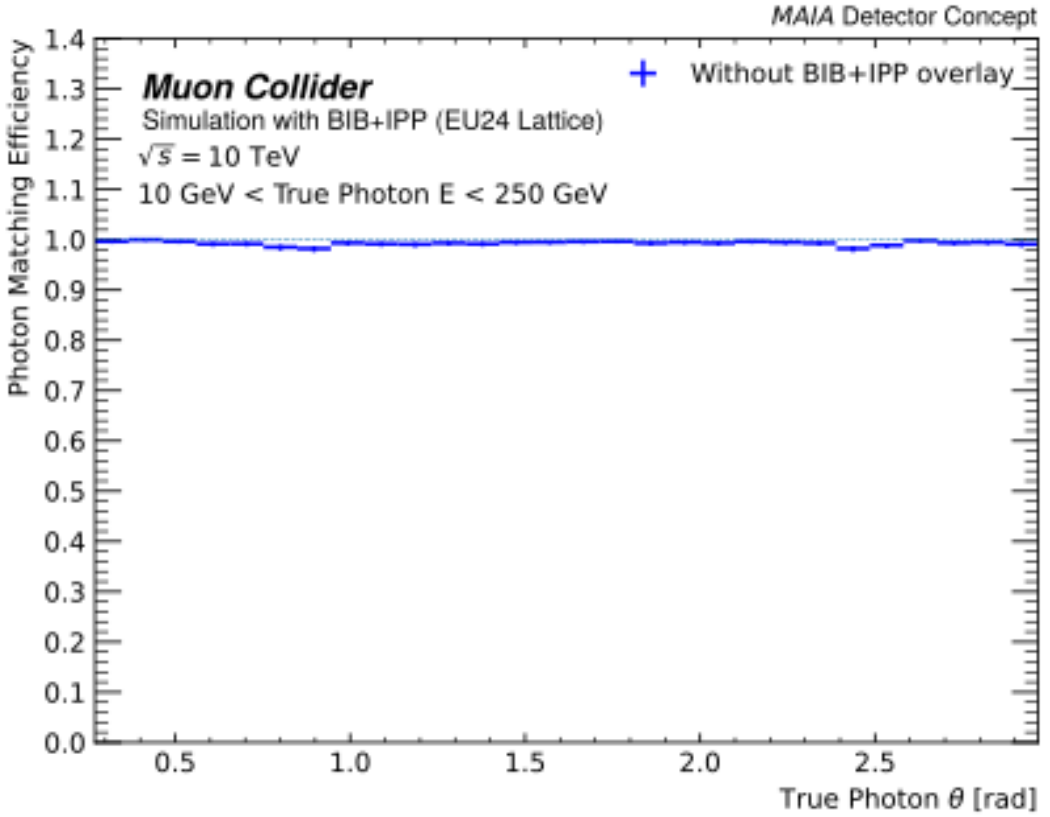
15 Jul 2026

Updates

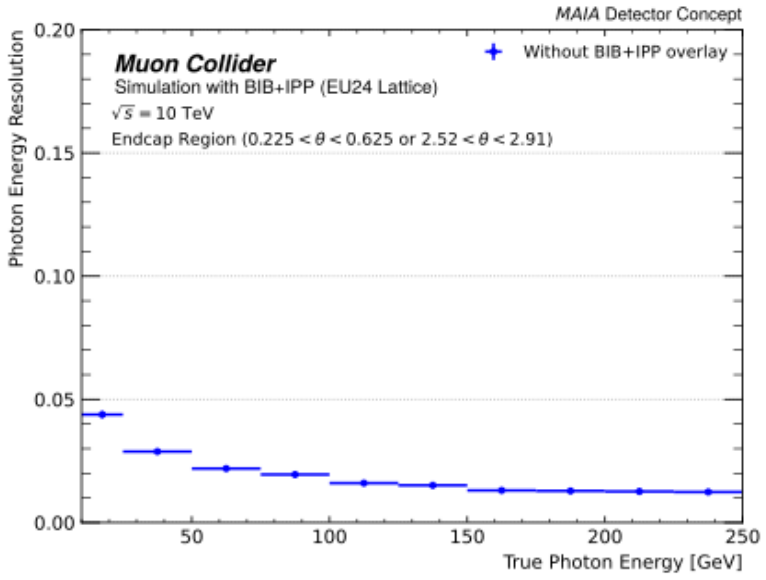
- After v4 thresholding fix, **drastic** improvements to photons+neutrons
- So far, only [0,250] GeV w/o BIB, but very promising
- The following plots do not have any calibration applied, as we are rethinking the 2D calibration scheme

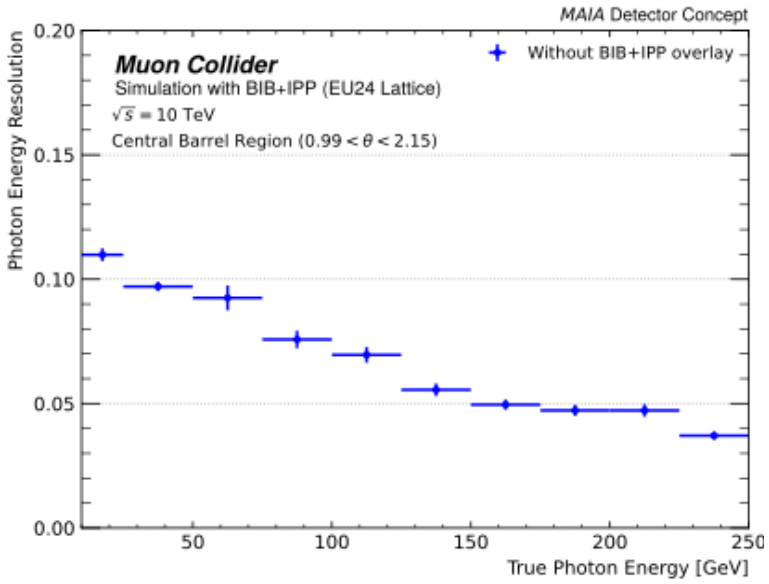
Photon Efficiency

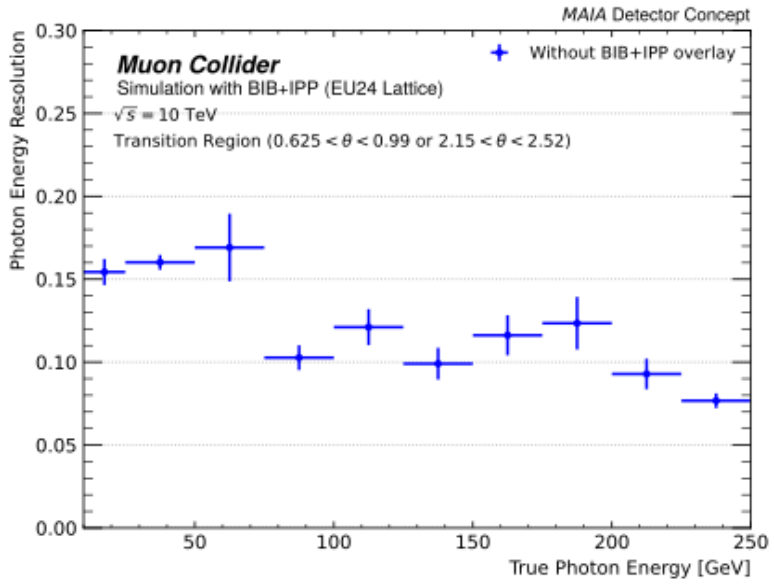




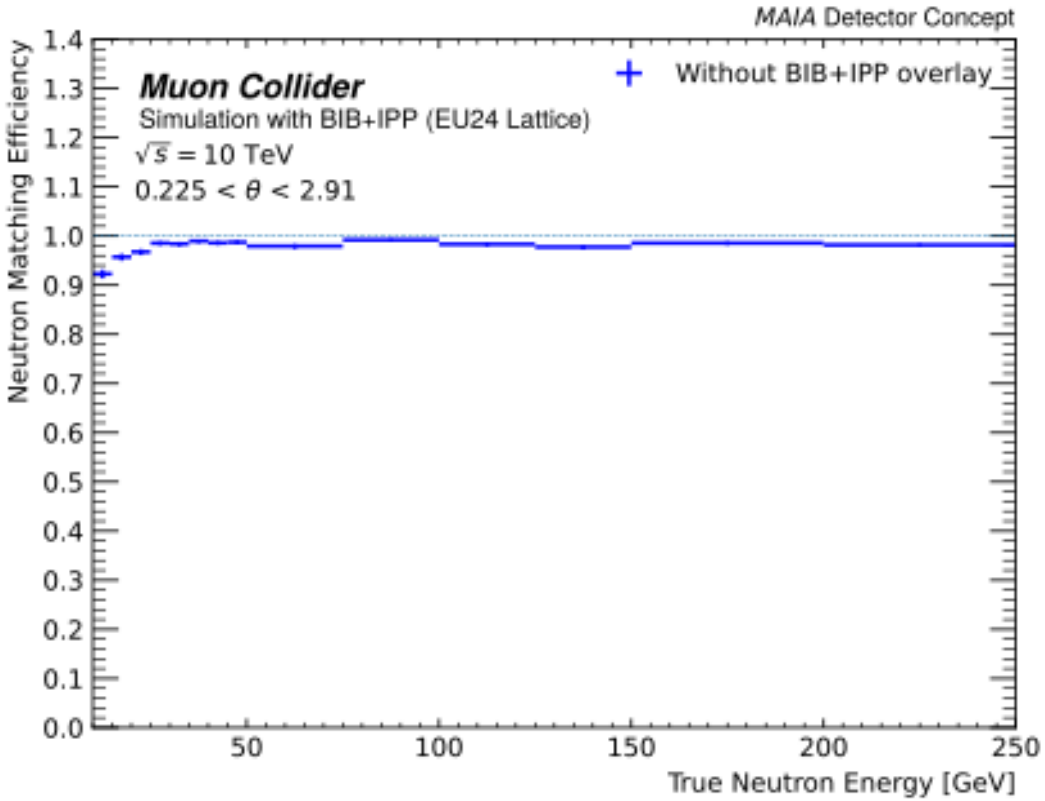
Photon Energy Resolution

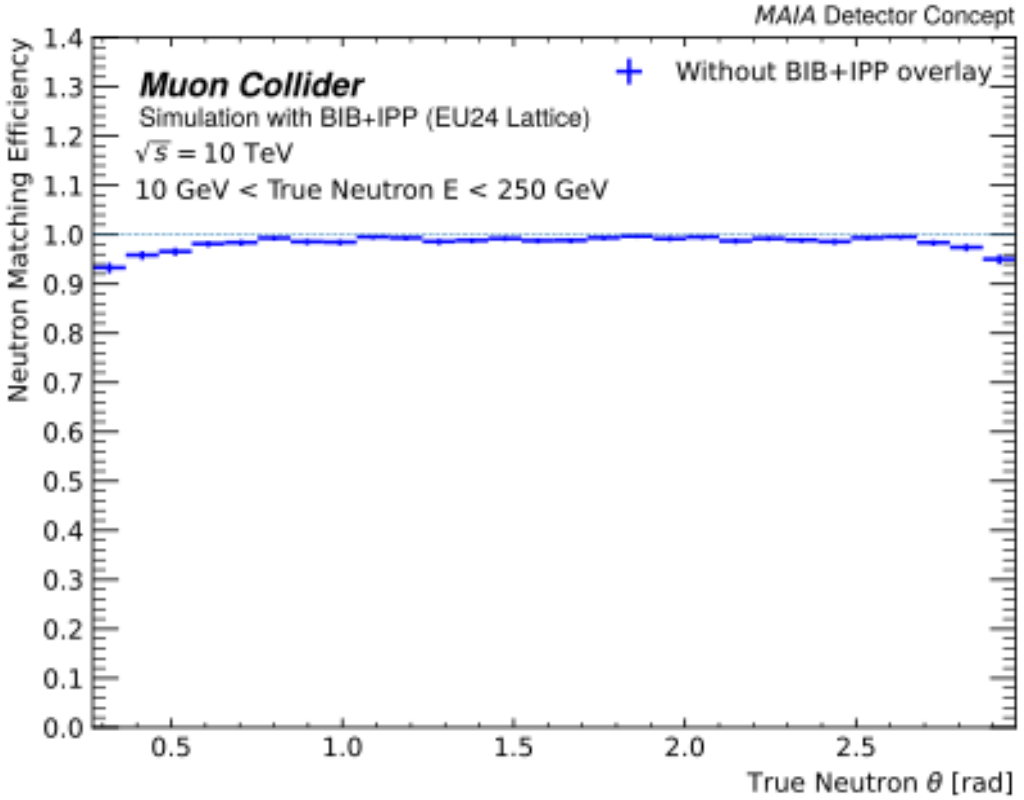




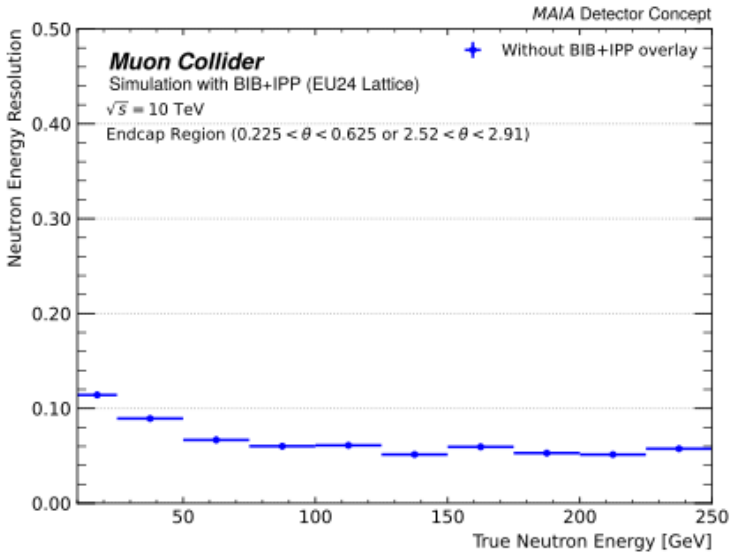


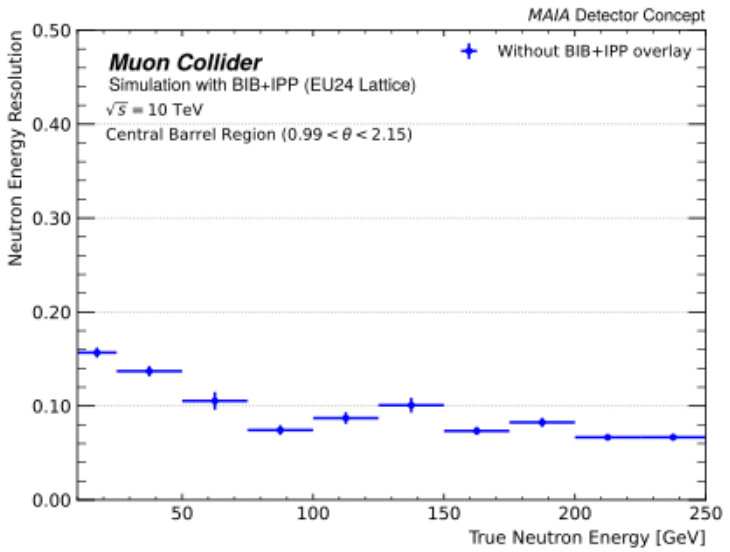
Neutron Efficiency

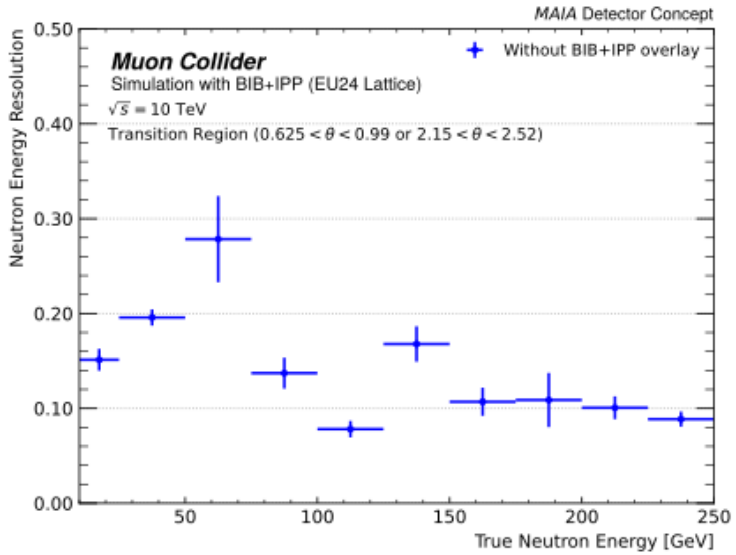




Neutron Energy Resolution





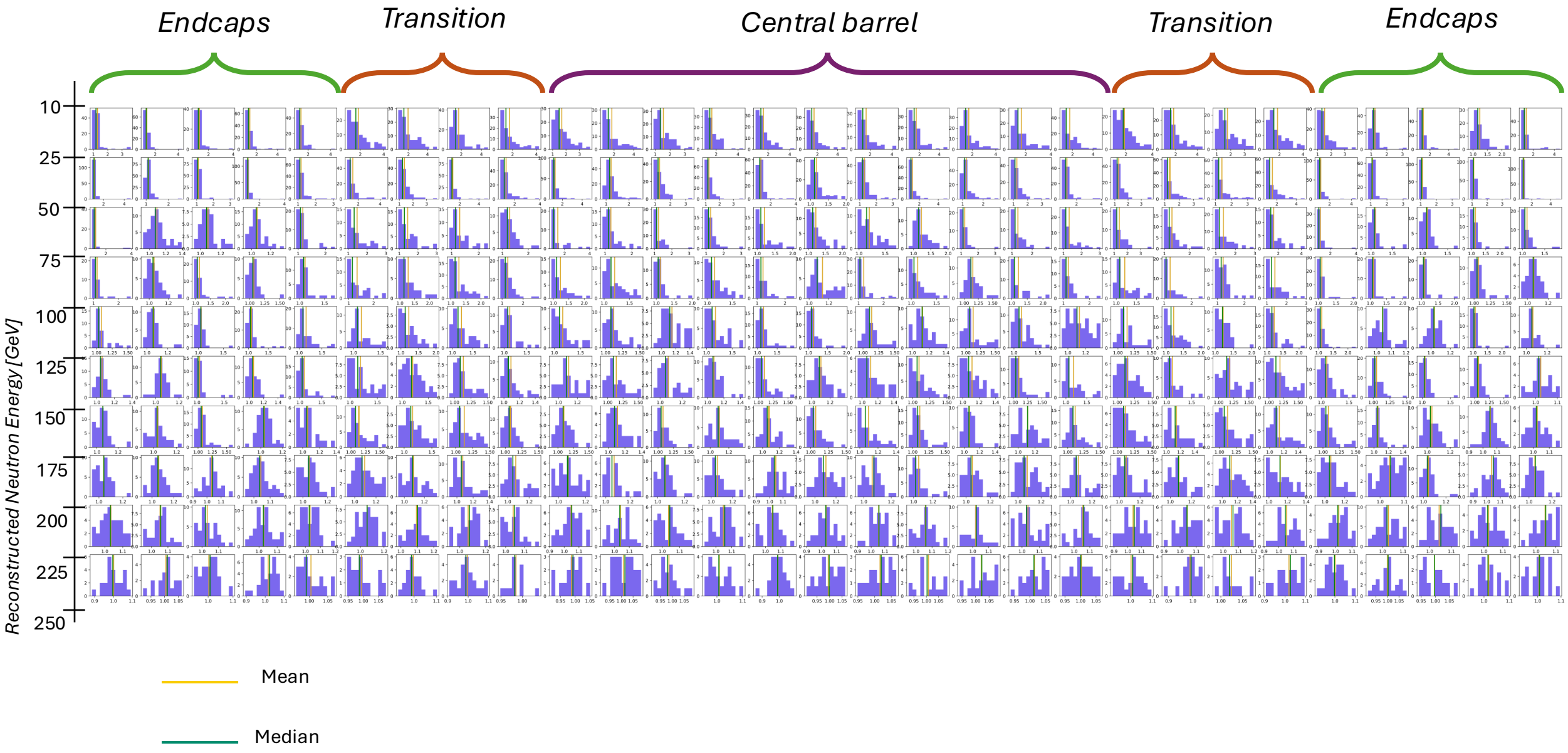


Up next…

- Will remake these with full energy range and BIB as soon as samples are available!
- After final touches, will add to Overleaf and start updating section text as well
- Beginning to draft my USMCC talk this week
- Additionally, Isobel has asked me to put together a summary of the bug finds and fixes over the last month or so I'd love to gather more details from those most closely involved (Tova + Fede especially)!

P.S. Some calibration things…

- Discissed with Tova re problems associated with just taking response average in each cell
- Tova recommended fitting a Gaussian in each cell and using the **fitted** mean to calibrate
- I looked into this, but (at least for the 0-250GeV binning) the response is not distributed normally in each cell
- See 2D histogram of histograms in next slide


Endcaps
Transition
Central barrel
Transition
Endcaps
Reconstructed Neutron Energy [GeV]
10
25
50
75
100
125
150
175
200
225
250
Mean
Median

Calibration next steps

- Will continue to explore different paths for fitting response distributions within the cells; wider energy bins, for instance, or different fitting functions
  - Some of the distributions look almost Poissonian or Crystal Ball-like
- Fortunately, v4 samples (so far) show much better response from the jump, less need for calibration