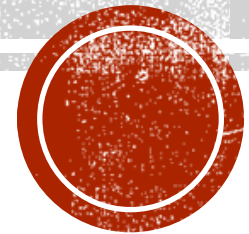


bHCAL Meeting — Neutron Calibration Update

Jan Vanek

University of New Hampshire

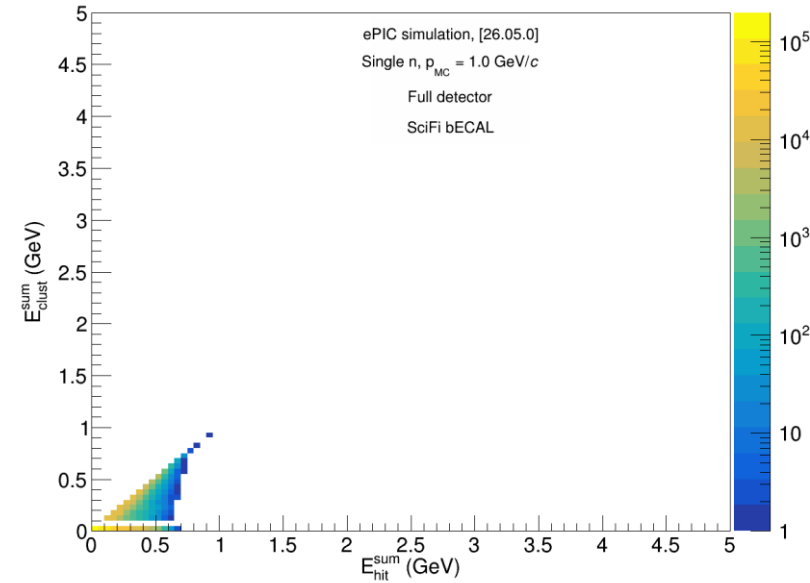
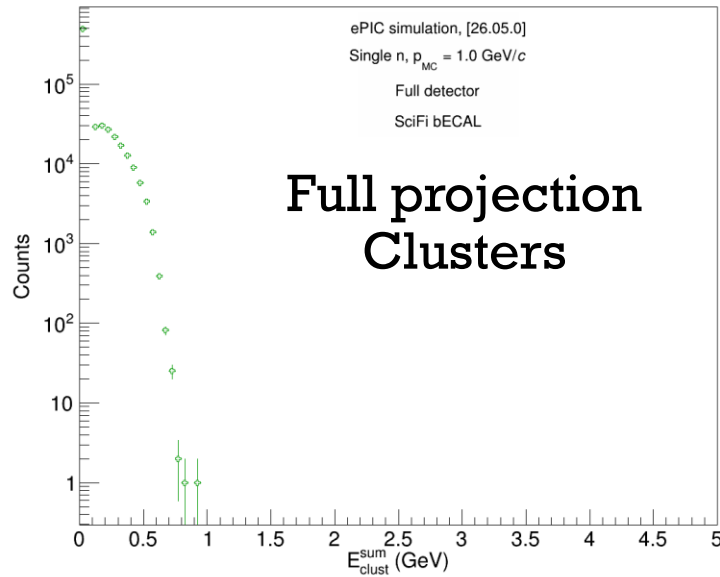
07/31/2026



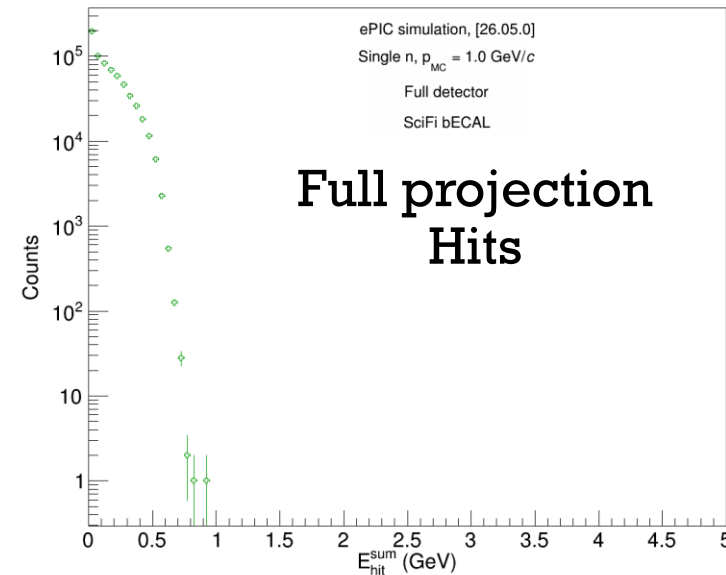
OVERVIEW

- Calibration QA: Hits vs. clusters
 - 2D distributions (hits vs. clusters)
 - Uncorrected energy deposition distributions without any normalizations
- Single particle simulation
 - Simulation campaign [26.05.0]
 - Focus on neutrons

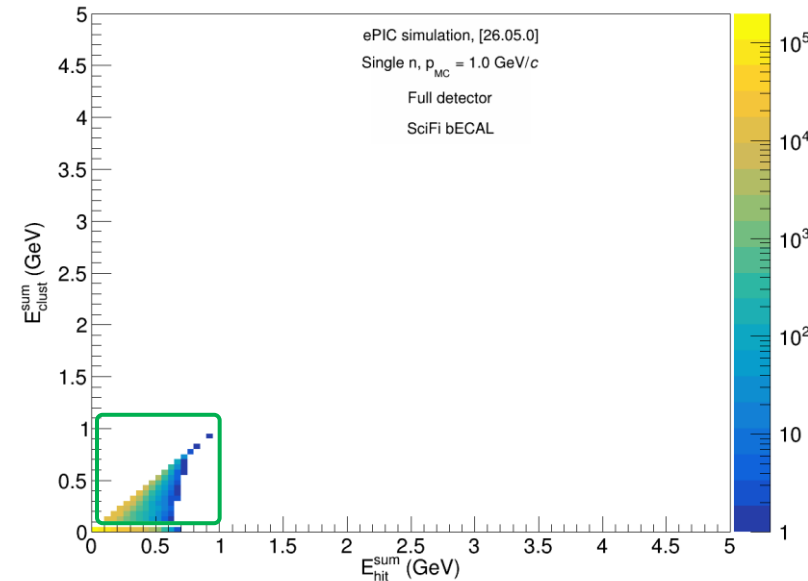
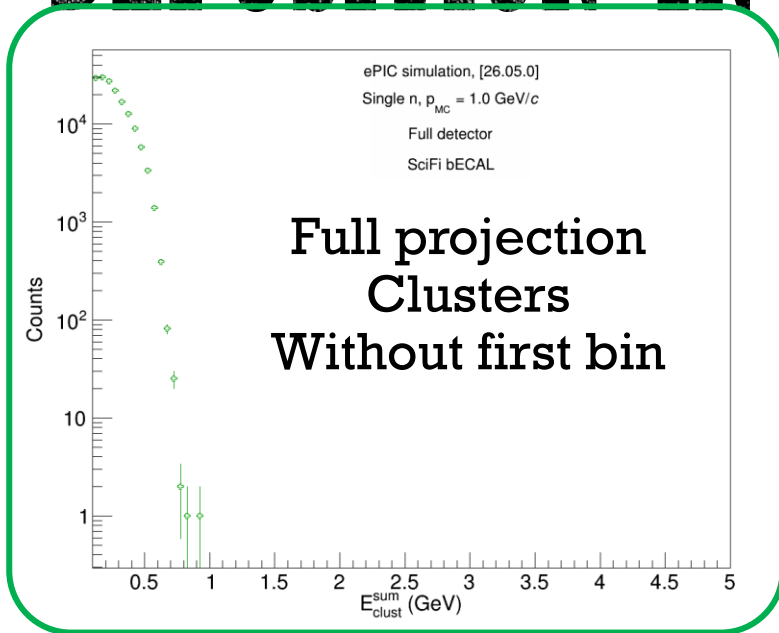
ENERGY DEPOSITION IN bECAL (1 GeV)



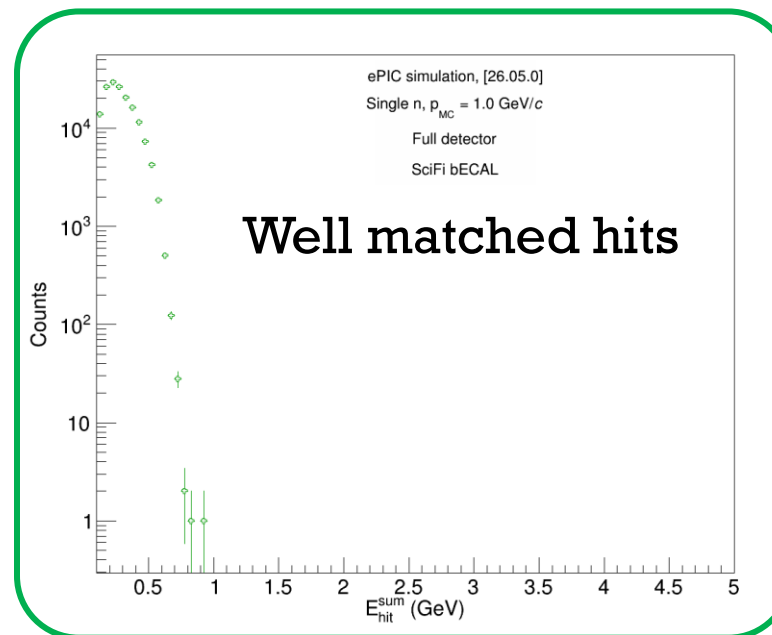
- Comparison of energy from sum of hits vs. sum of clusters for SciFi bECAL for 1 GeV neutrons
- Full projections for both sum of hits and sum of clusters



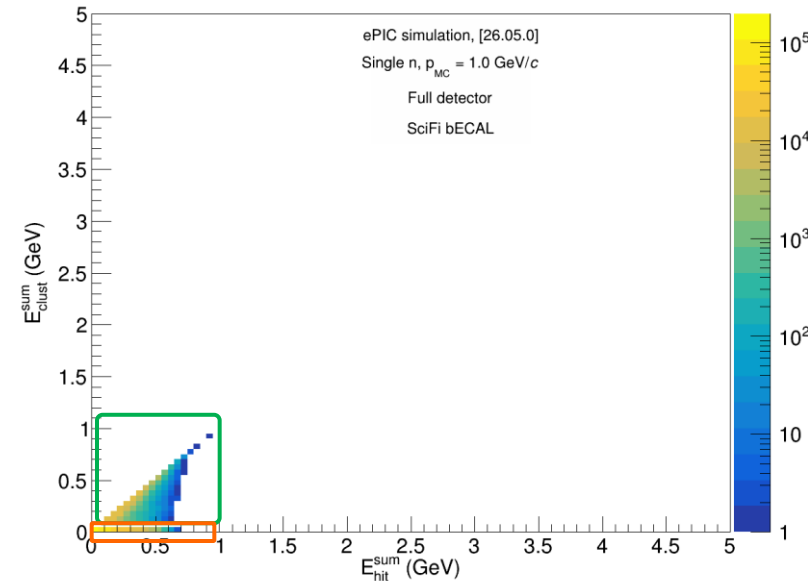
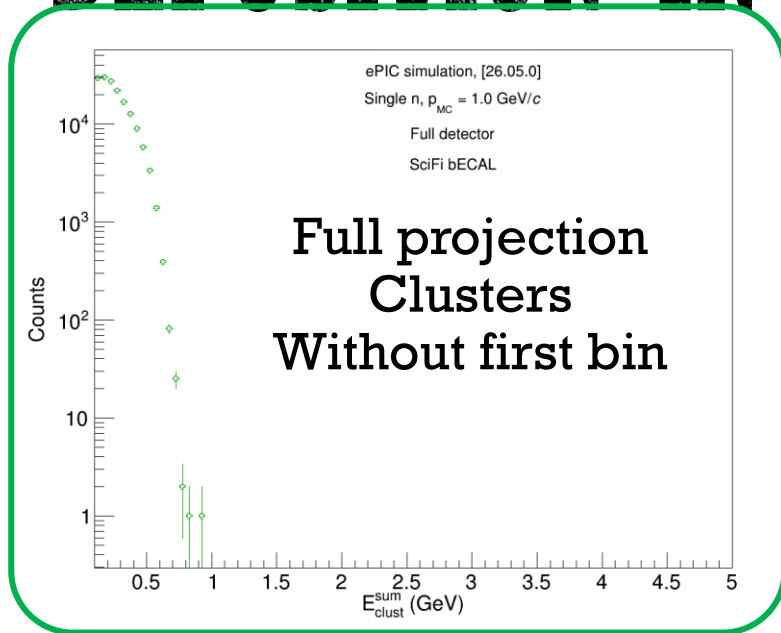
ENERGY DEPOSITION IN bECAL (1 GeV)



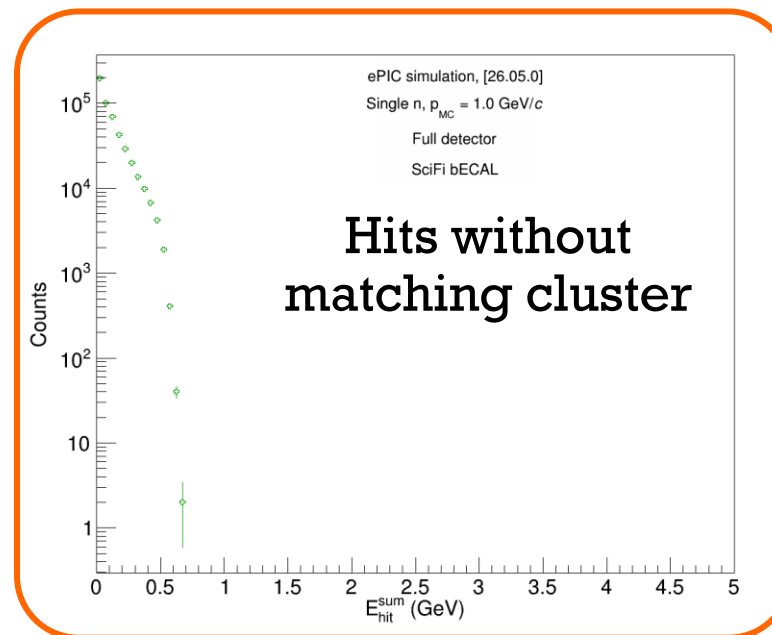
- Comparison of energy from sum of hits vs. sum of clusters for SciFi bECAL for 1 GeV neutrons
- Full projections for sum of clusters without first bin plotted
 - Removes unmatched hits in bin 1
- Sum of hits only for hits **with** well reconstructed clusters



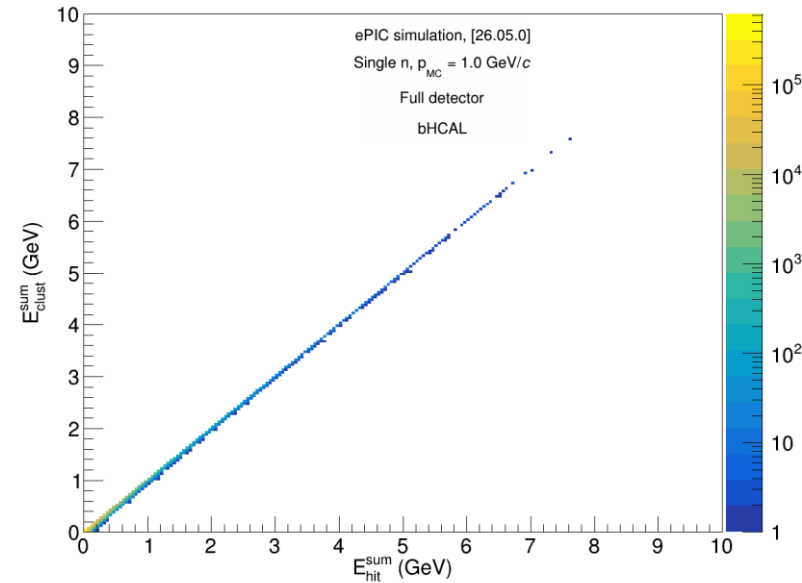
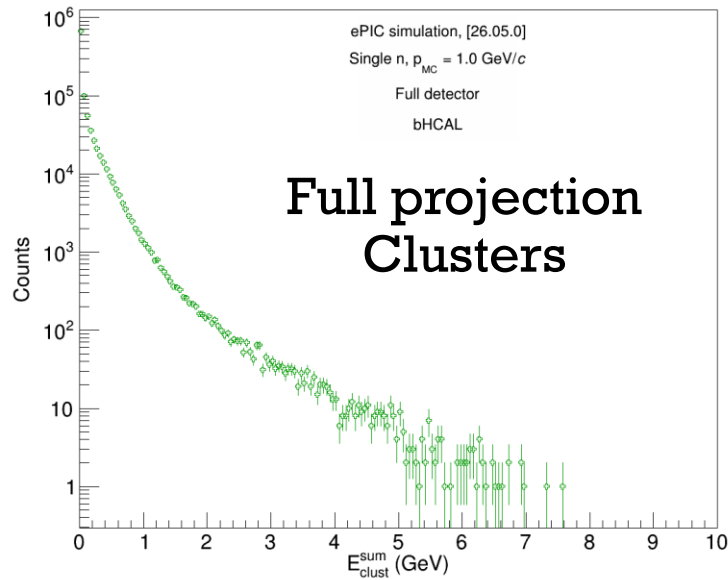
ENERGY DEPOSITION IN bECAL (1 GeV)



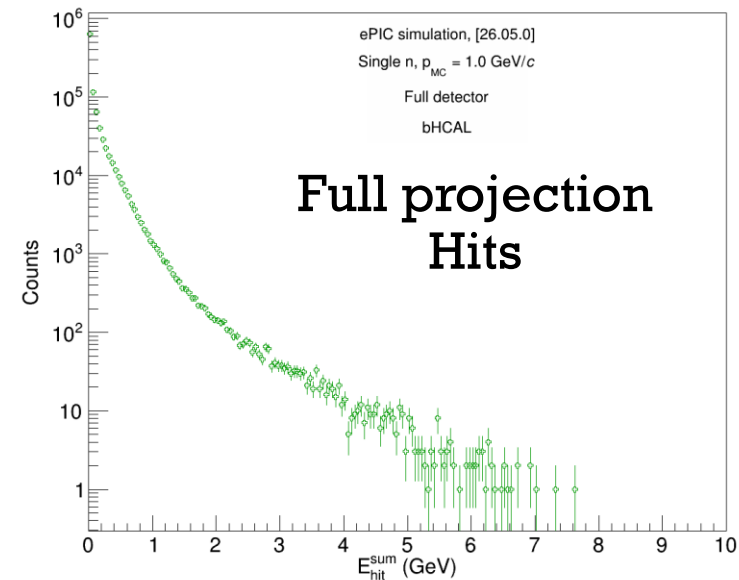
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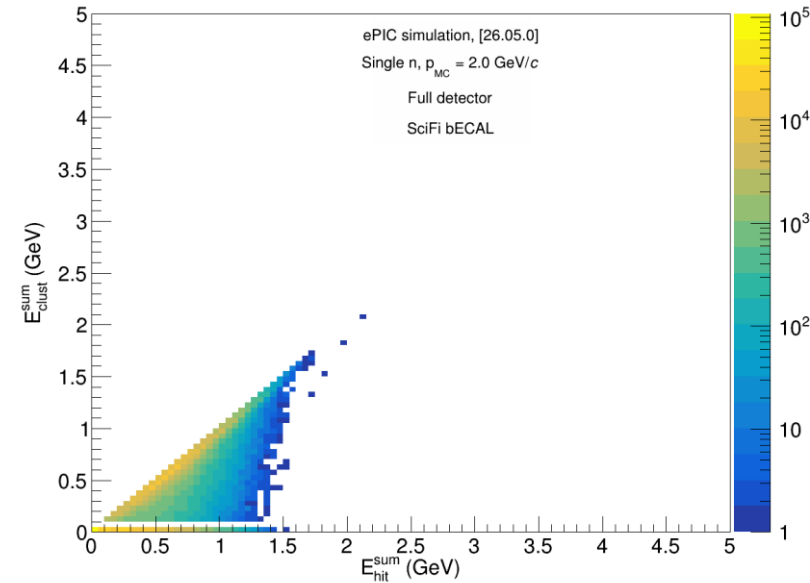
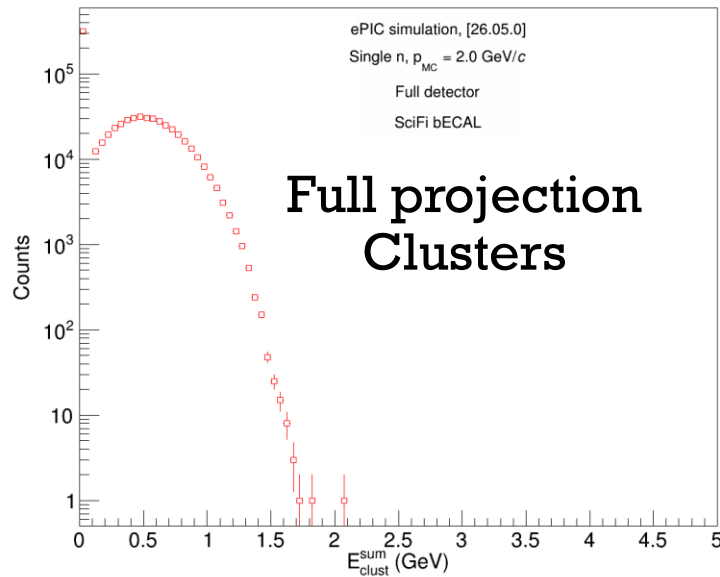
ENERGY DEPOSITION IN bHCAL (1 GeV)



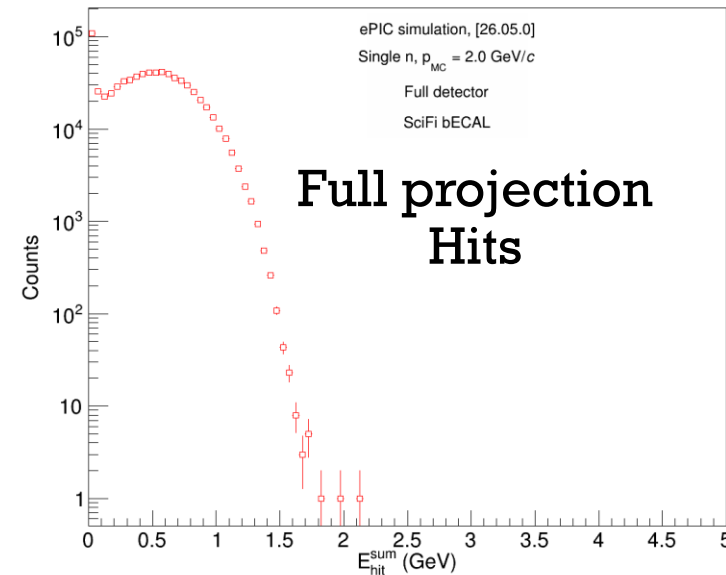
- Comparison of energy from sum of hits vs. sum of clusters for SciFi bECAL for 1 GeV neutrons
- Full projections for both sum of hits and sum of clusters
- No significant mis-match observed for bHCAL



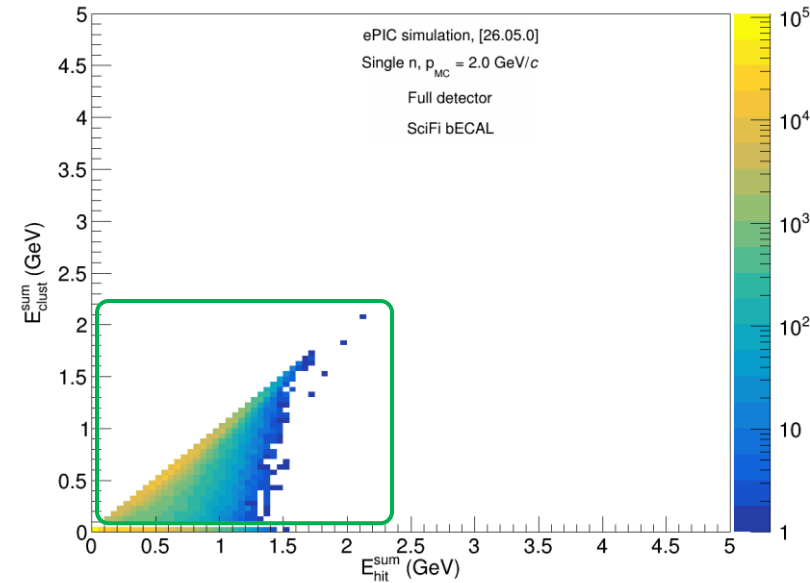
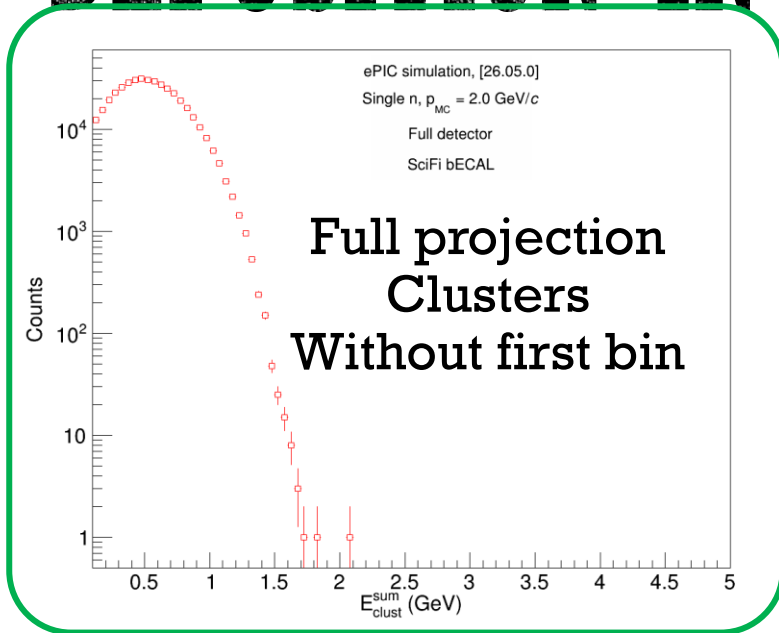
ENERGY DEPOSITION IN bECAL (2 GeV)



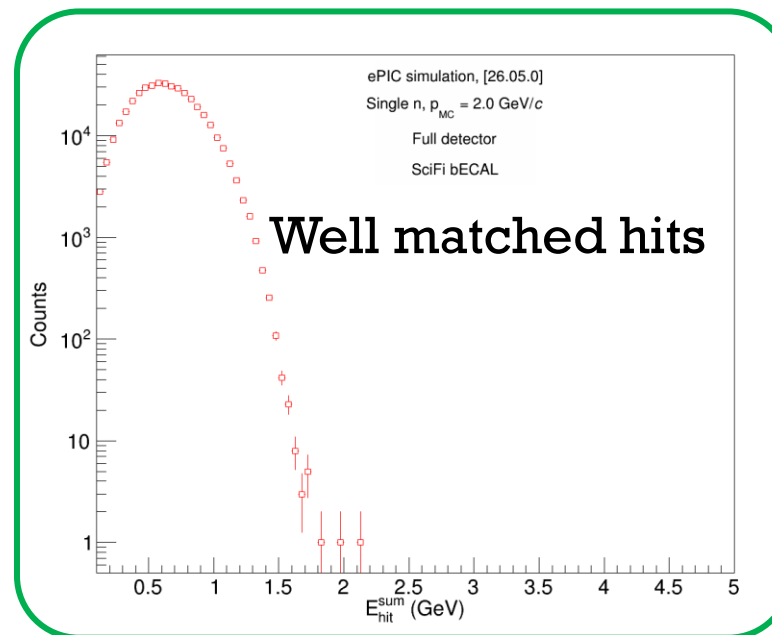
- Comparison of energy from sum of hits vs. sum of clusters for SciFi bECAL for 2 GeV neutrons
- Full projections for both sum of hits and sum of clusters



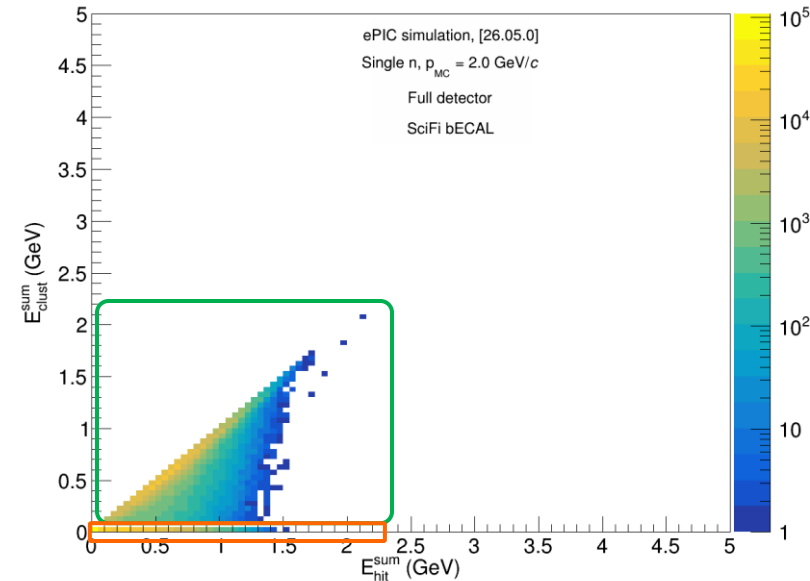
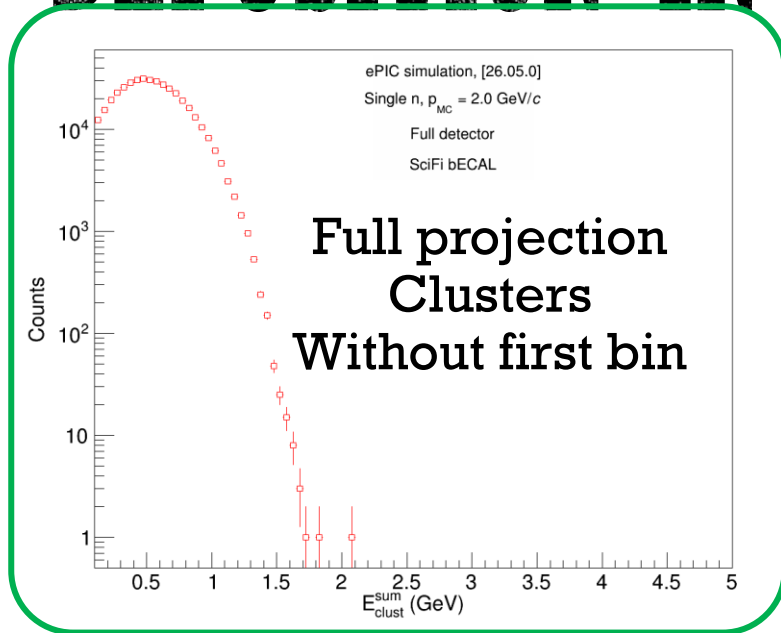
ENERGY DEPOSITION IN bECAL (2 GeV)



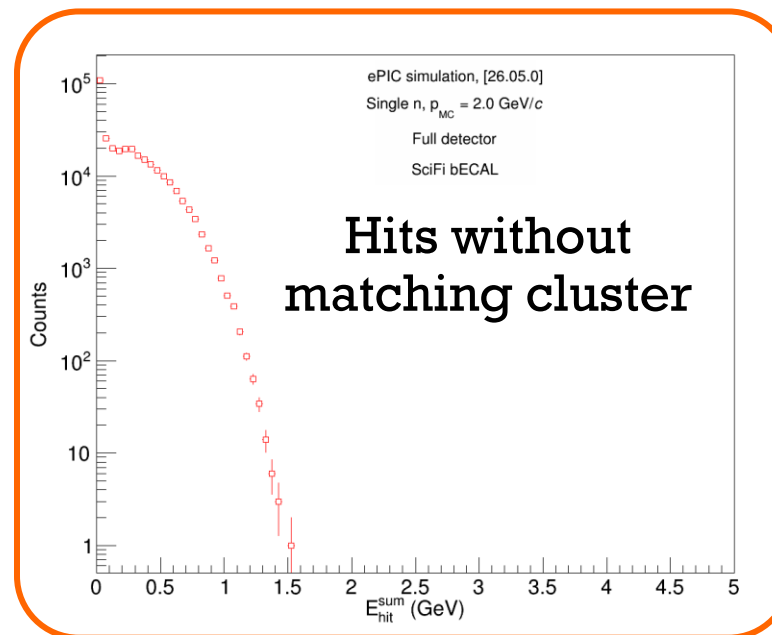
- Comparison of energy from sum of hits vs. sum of clusters for SciFi bECAL for 2 GeV neutrons
- Full projections for sum of clusters without first bin plotted
 - Removes unmatched hits in bin 1
- Sum of hits only for hits **with** well reconstructed clusters



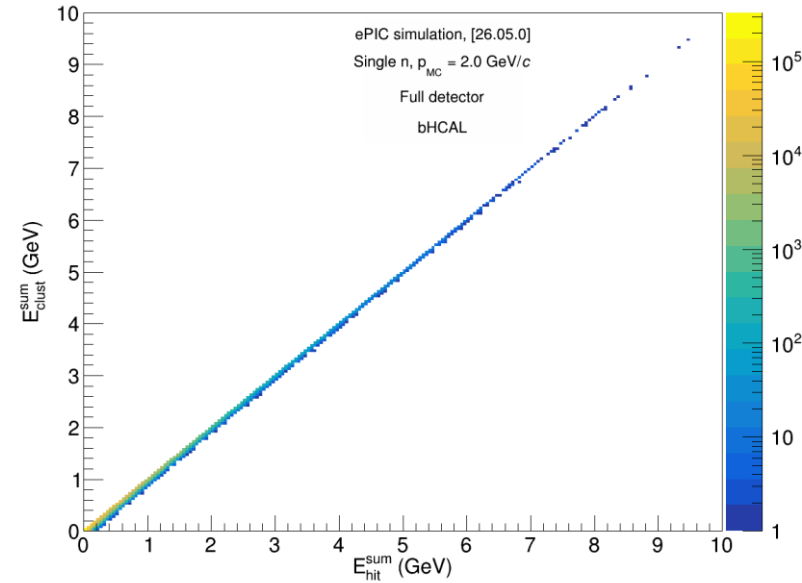
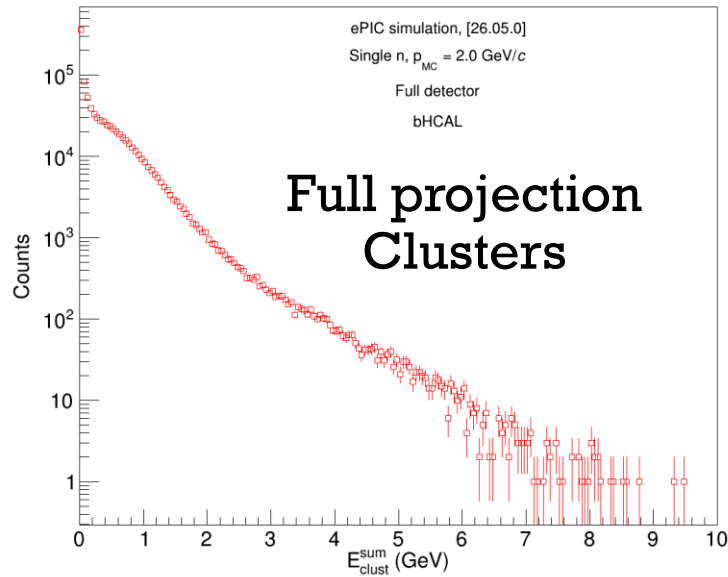
ENERGY DEPOSITION IN bECAL (2 GeV)



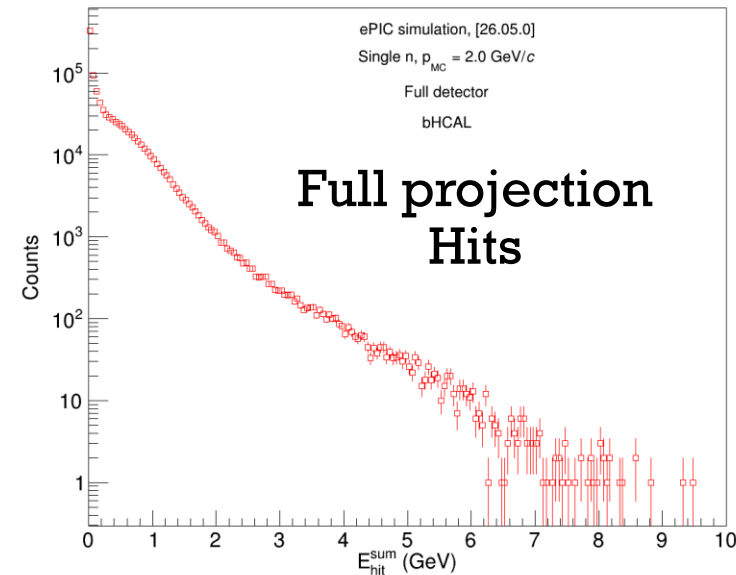
- Comparison of energy from sum of hits vs. sum of clusters for SciFi bECAL for 2 GeV neutrons
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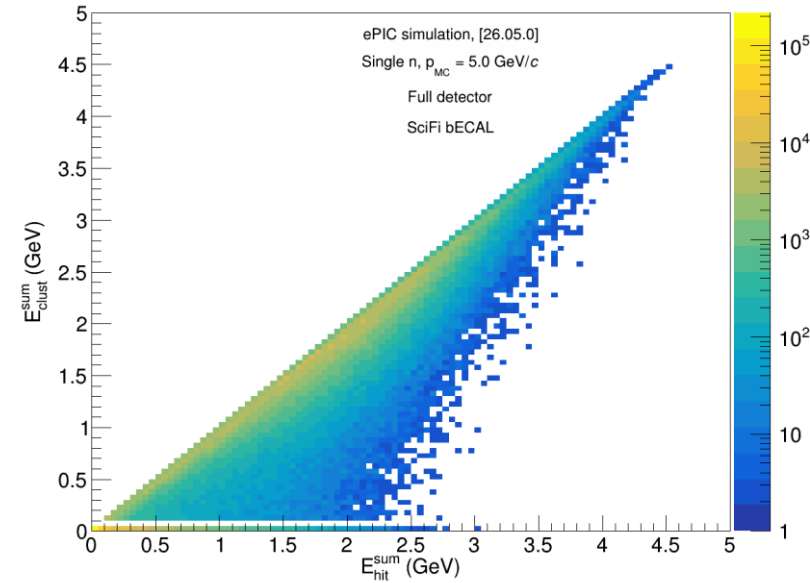
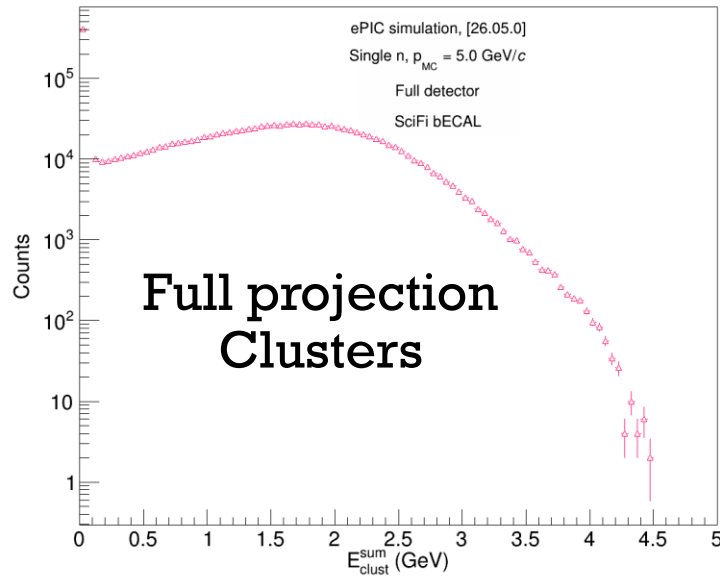
ENERGY DEPOSITION IN bHCAL (2 GeV)



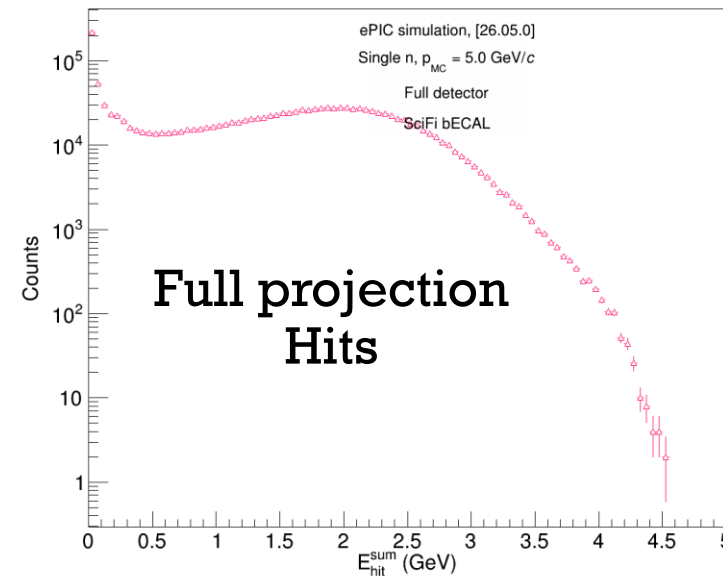
- Comparison of energy from sum of hits vs. sum of clusters for SciFi bECAL for 2 GeV neutrons
- Full projections for both sum of hits and sum of clusters
- No significant mis-match observed for bHCAL



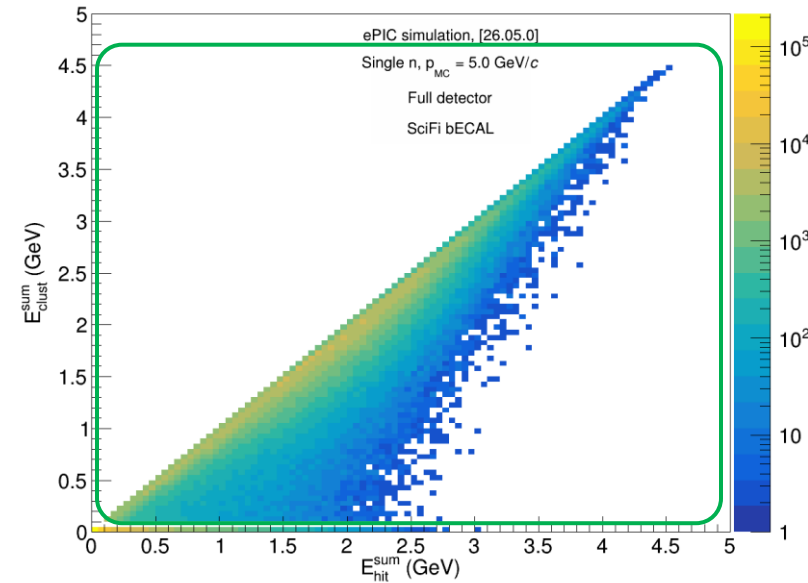
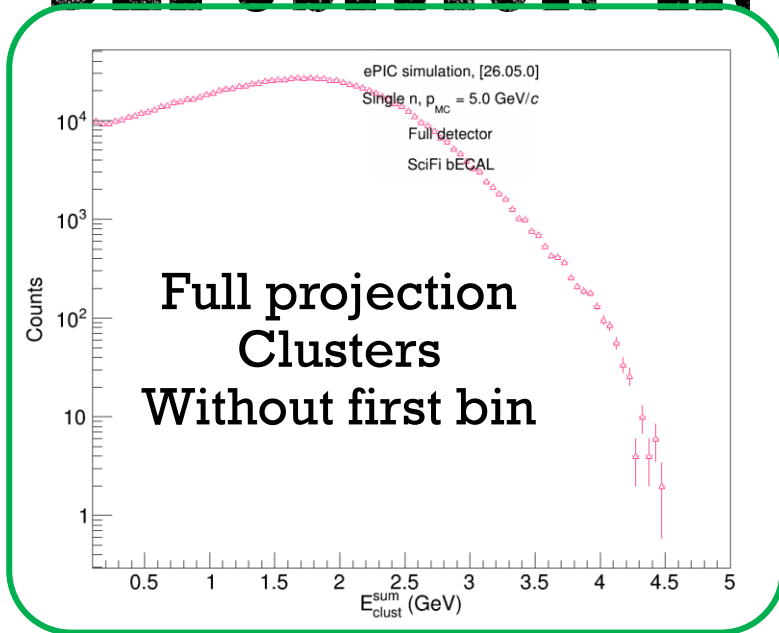
ENERGY DEPOSITION IN bECAL (5 GeV)



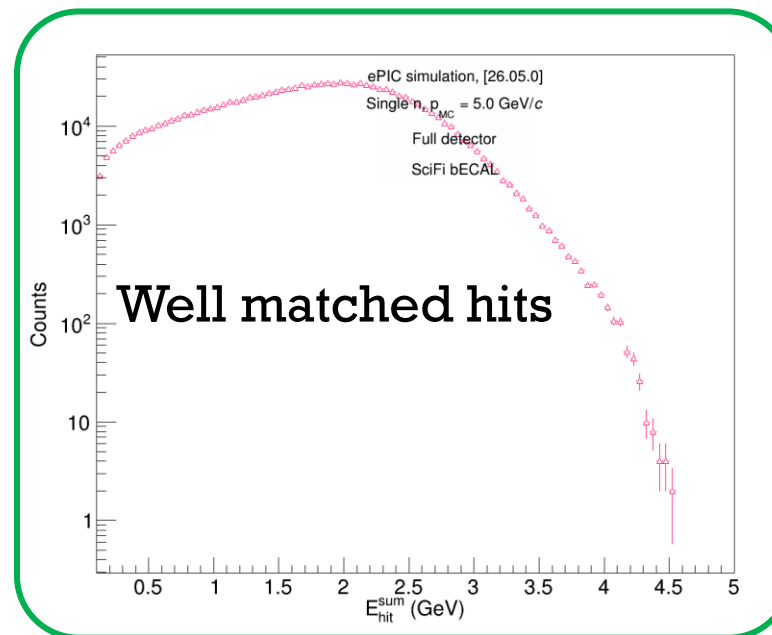
- Comparison of energy from sum of hits vs. sum of clusters for SciFi bECAL for 5 GeV neutrons
- Full projections for both sum of hits and sum of clusters



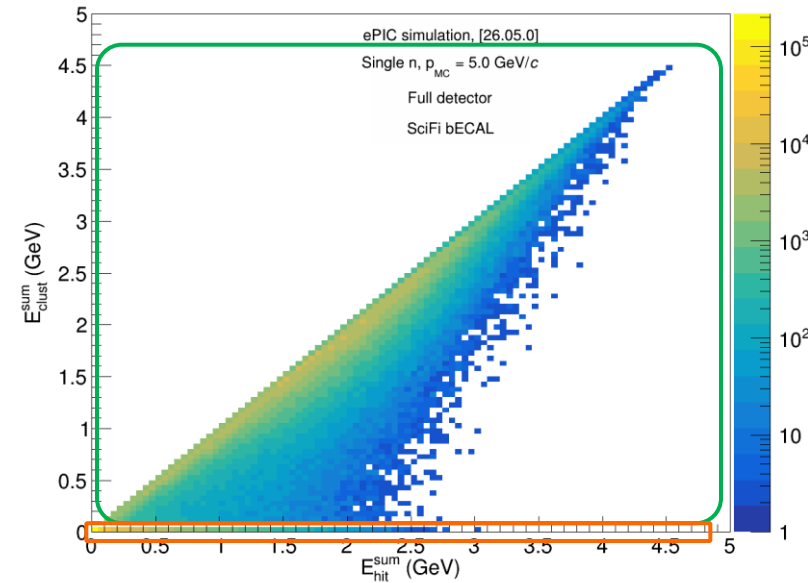
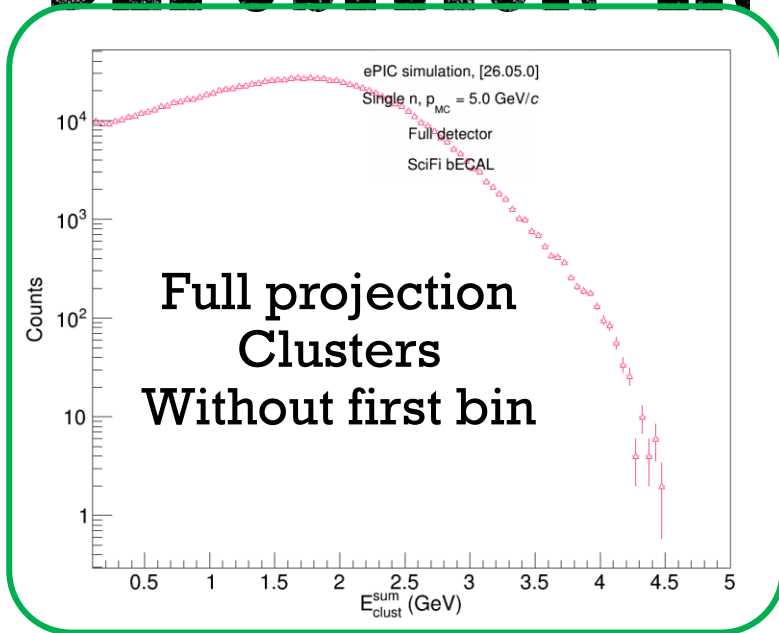
ENERGY DEPOSITION IN bECAL (5 GeV)



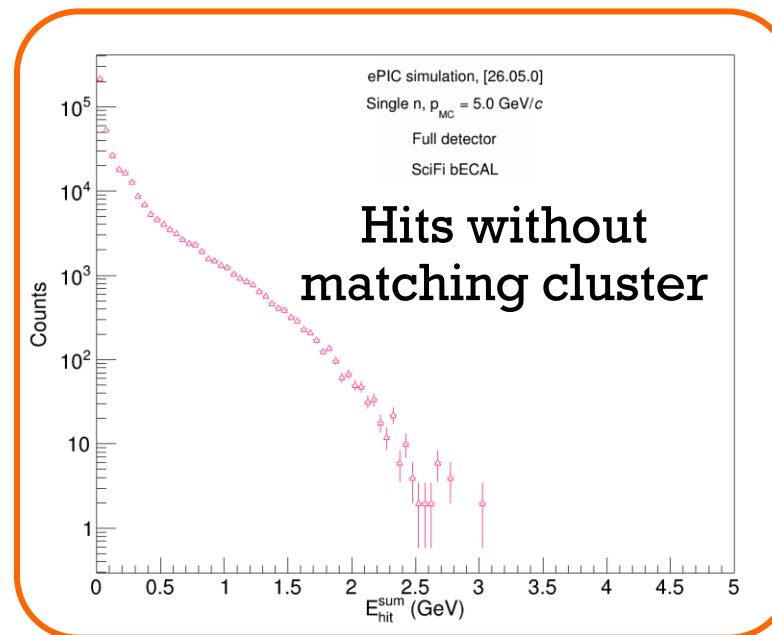
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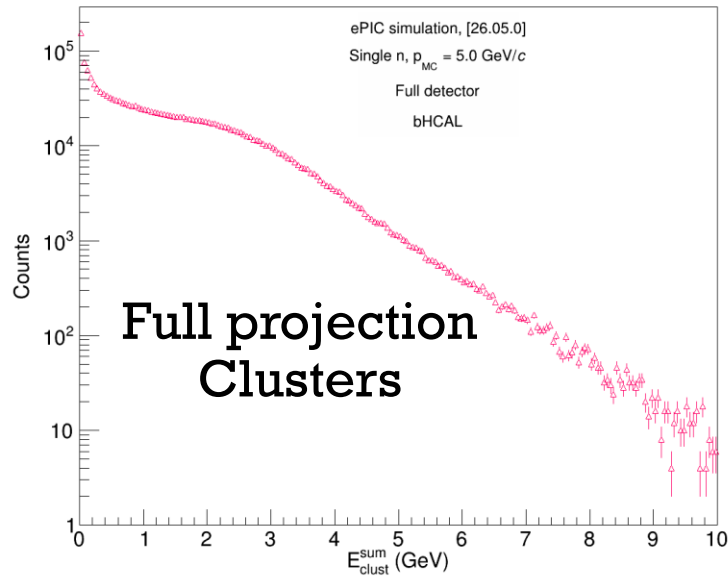
ENERGY DEPOSITION IN bECAL (5 GeV)



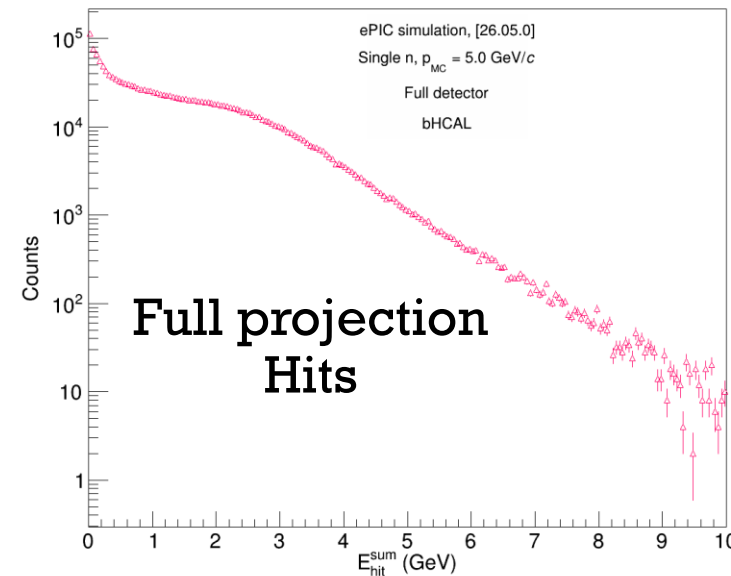
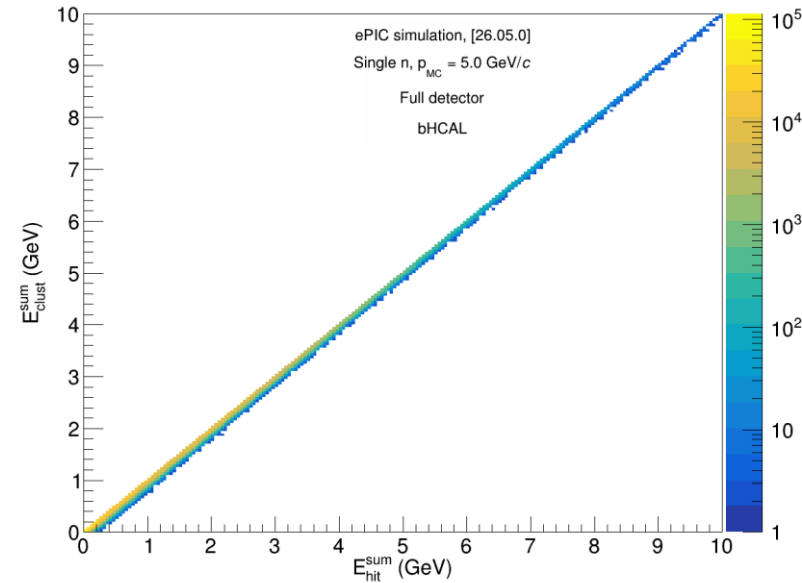
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ENERGY DEPOSITION IN bHCAL (5 GeV)



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- Full projections for both sum of hits and sum of clusters
- No significant mis-match observed for bHCAL



SUMMARY AND OUTLOOK

- Clustering for bECAL rejects some hits
 - Signal appears cleaner, but more detailed study needed to fully understand the effect
- Clustering for bHCAL does not appear to have significant influence on shape of energy deposition distributions
- Outlook:
 - Add comparisons to leading clusters
 - More detailed QA of current study
 - Main focus on clustering in bECAL
 - Other particle species with clusters
 - Both QA and calibrations

THANK YOU FOR ATTENTION