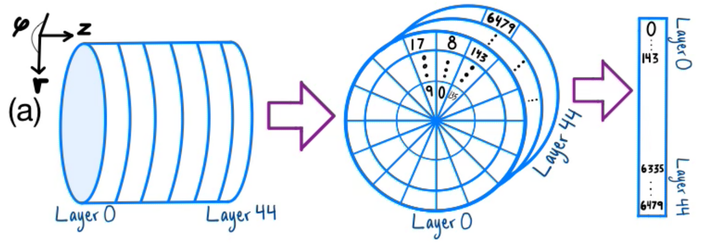
QVAE w/ Pegasus

Apr 15th

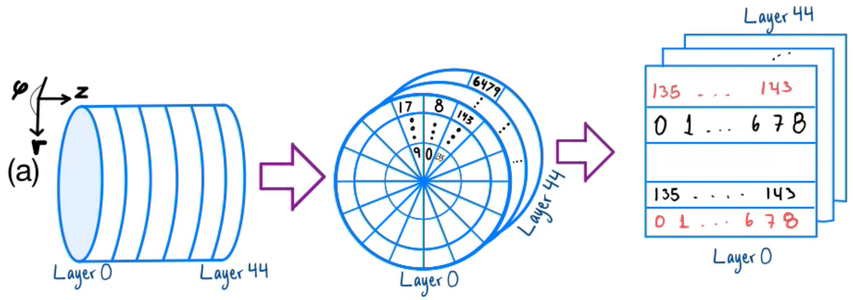
New CNN

Robust Tree

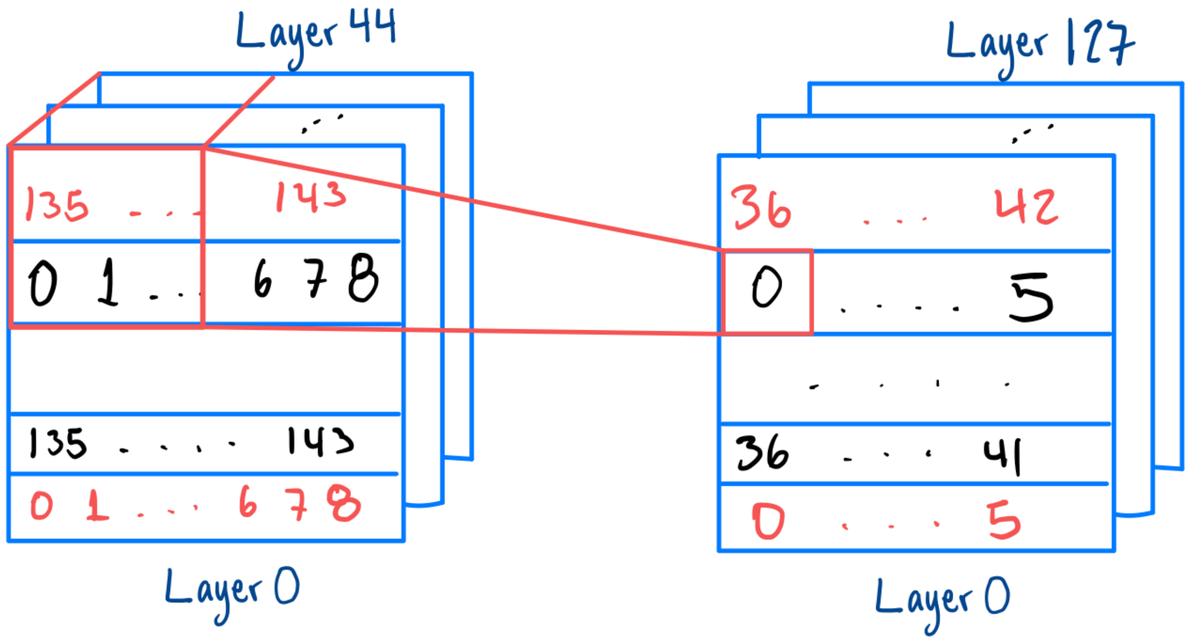


New Model

No hierarchies



Conv Blocks with Periodic Boundaries Padding



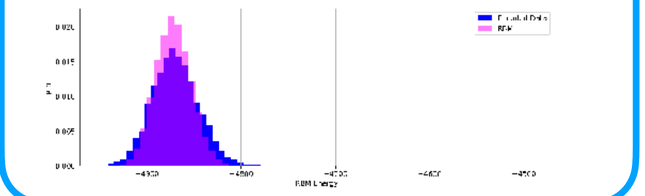
We also use this boundary padding in the decoder as well.

RBM histogram

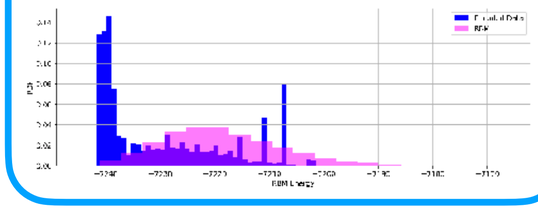
Comparison between models with hierarchies and models w/o

Models in blue boxes use 4 hierarchy levels

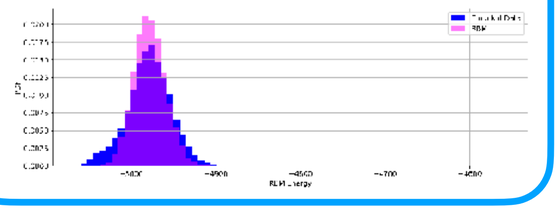
rural-cosmos-358



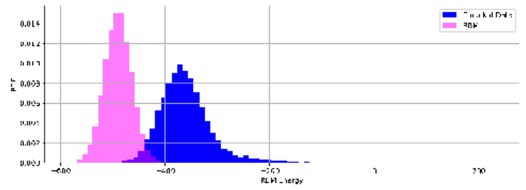
dark-sky-357



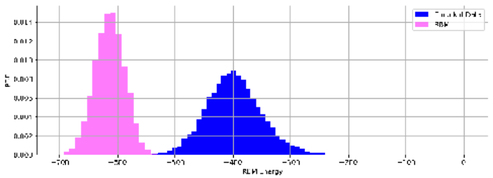
northern-microwave-356



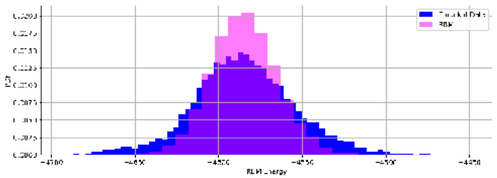
brisk-surf-355



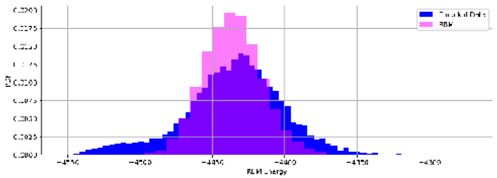
woven-snow-354



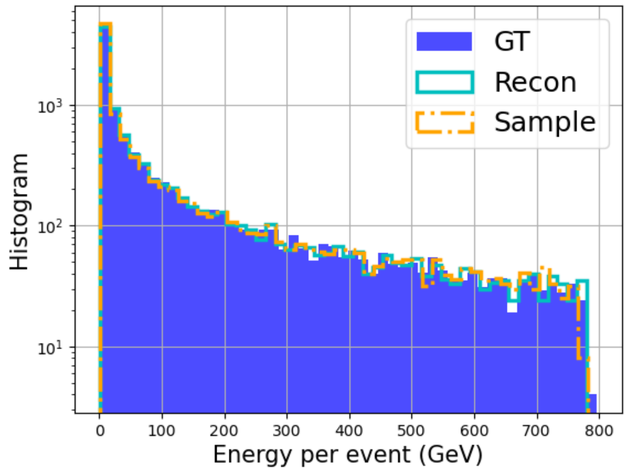
emissary-think-tank-353

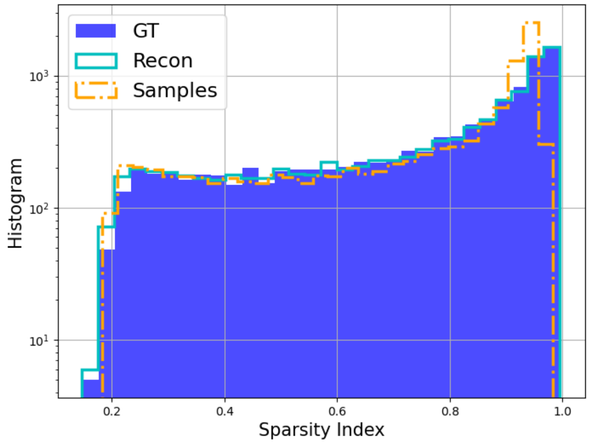


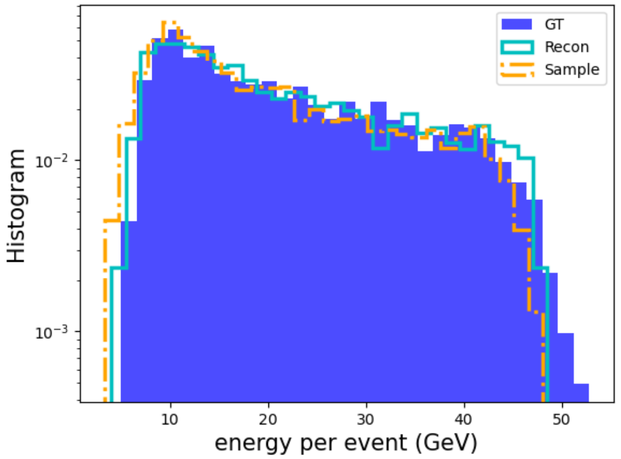
worldly-fog-352

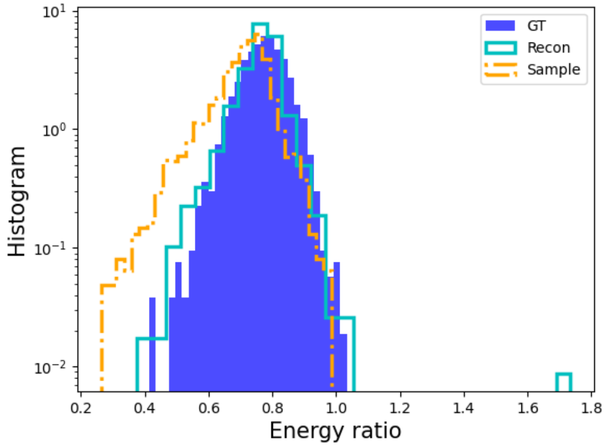


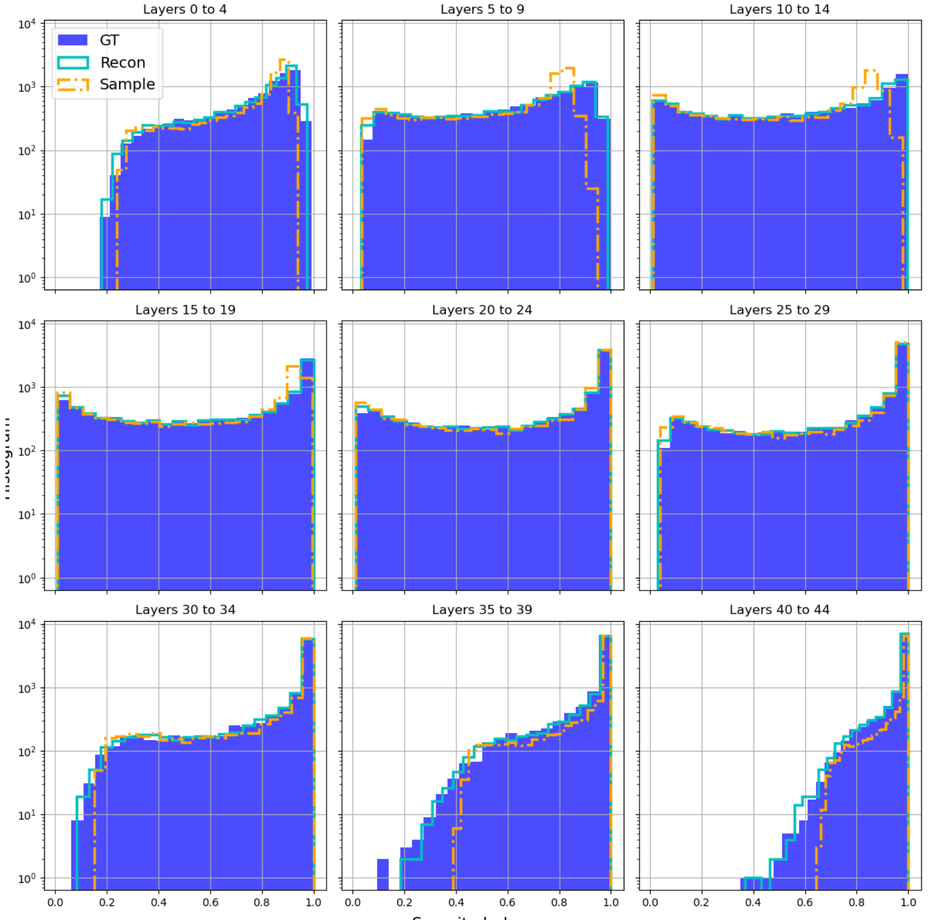
Results

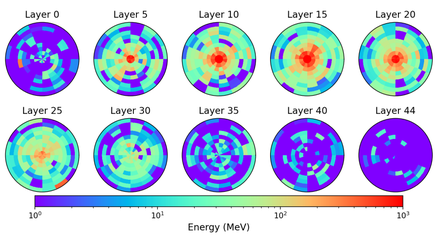


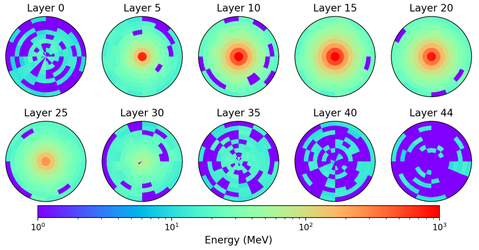










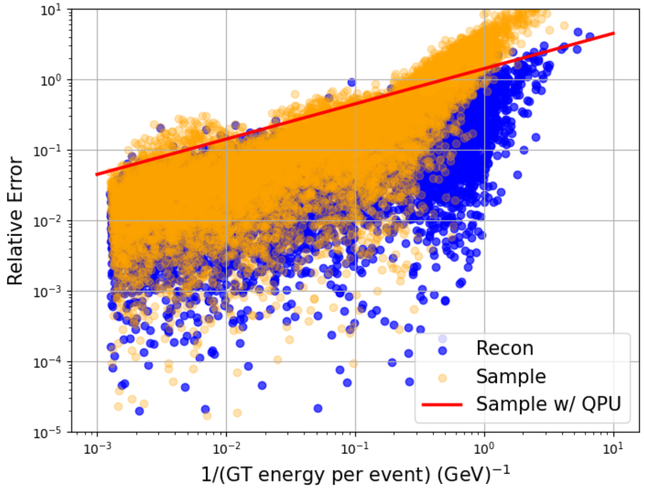


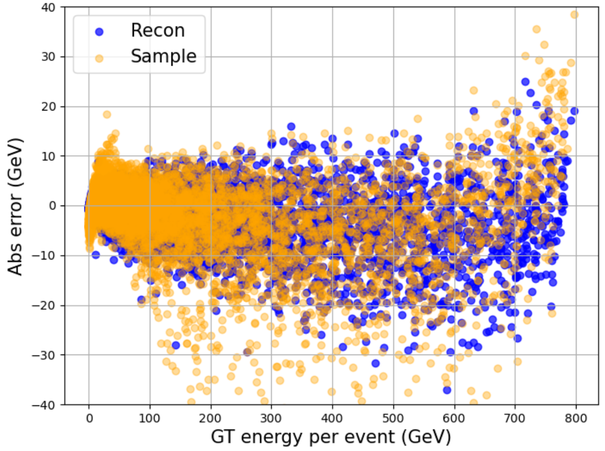
$$10GeV < E_{inc} < 60GeV$$

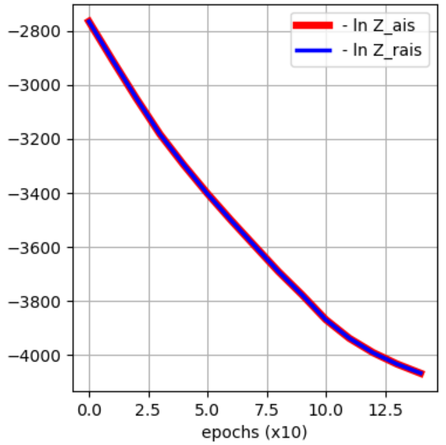
Target

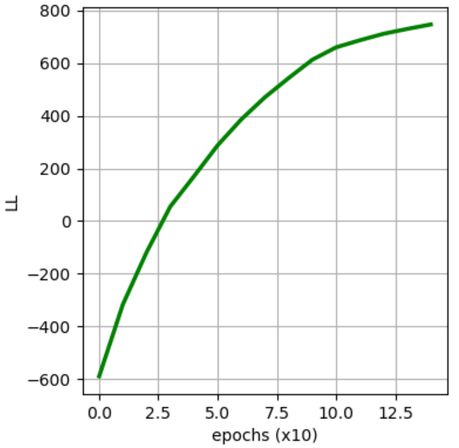
Recon

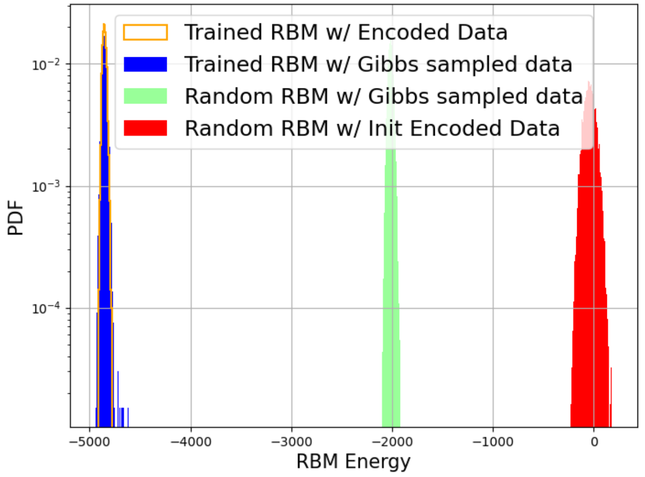
Results

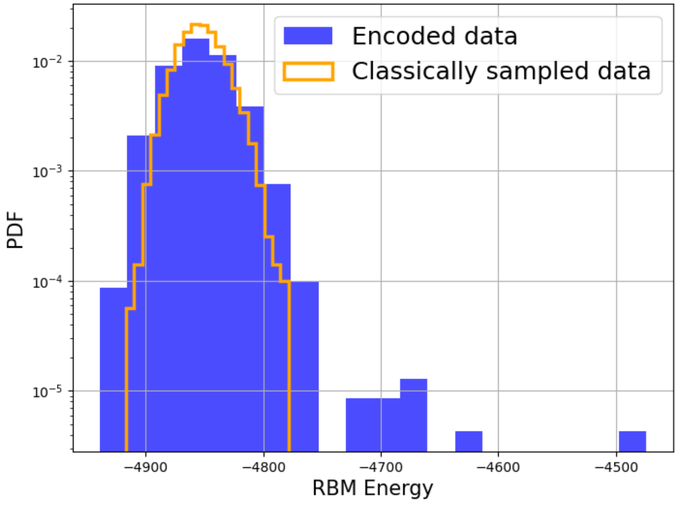

Relative Error
1/(GT energy per event) (GeV)$^{-1}$
Recon
Sample
Sample w/ QPU


Abs error (GeV)
GT energy per event (GeV)
Recon
Sample

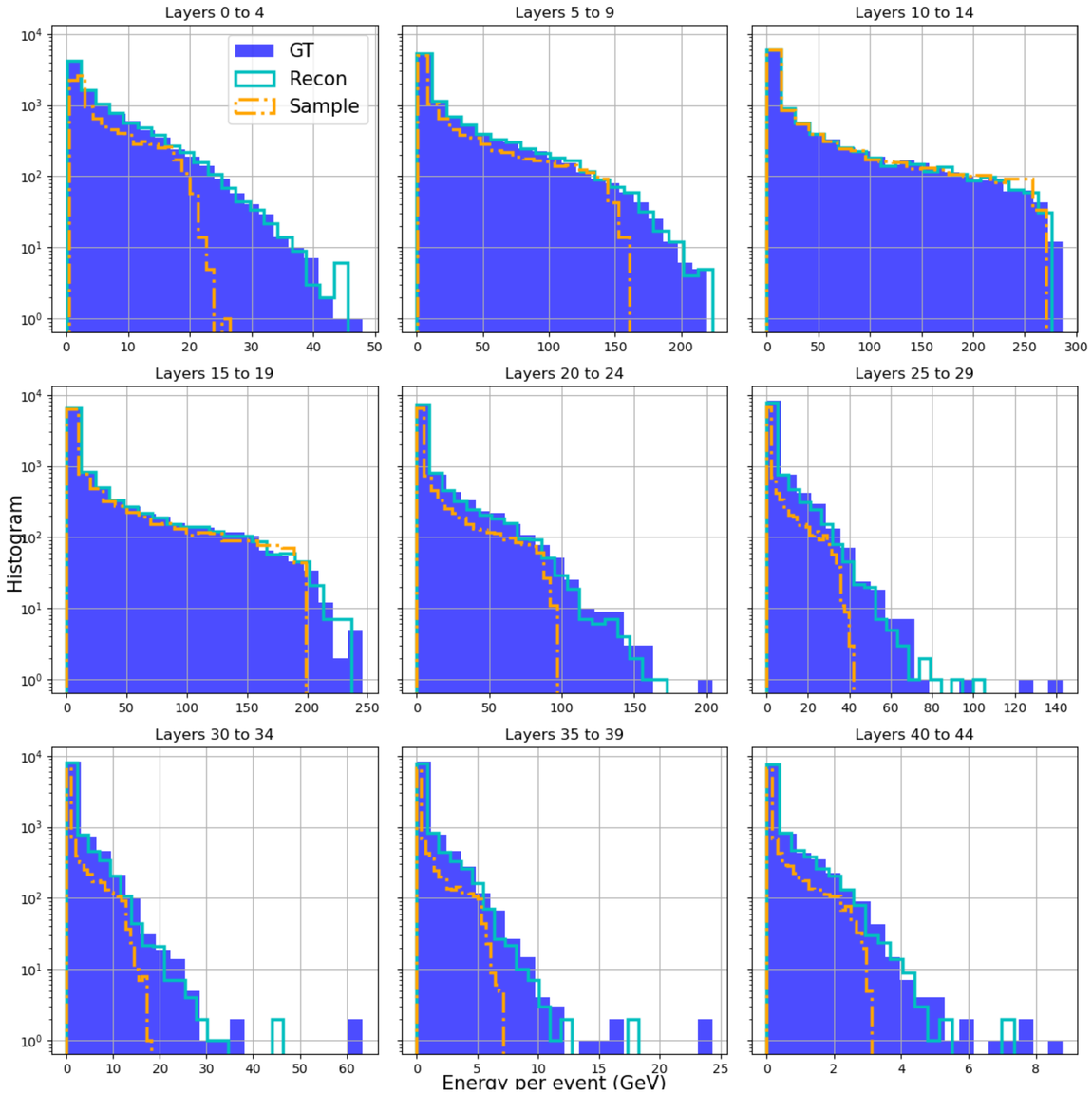

- ln Z_ais
- ln Z_rais
epochs (x10)


LL
epochs (x10)

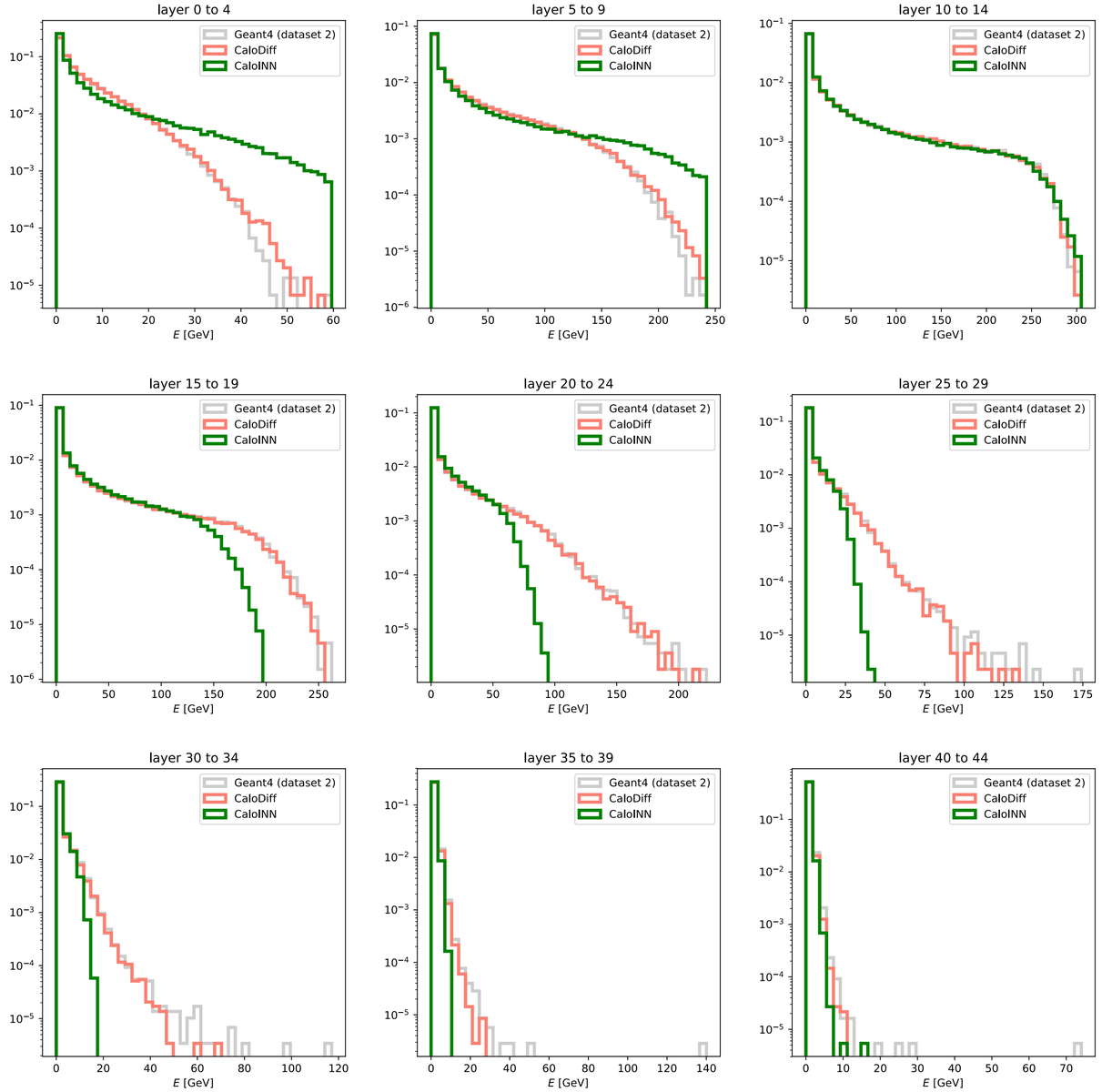

Trained RBM w/ Encoded Data
Trained RBM w/ Gibbs sampled data
Random RBM w/ Gibbs sampled data
Random RBM w/ Init Encoded Data
PDF
RBM Energy


Encoded data
Classically sampled data
PDF
RBM Energy

Results



New model



E inc of all 2

CaloDiff & CaloINN

Summary

- New encoder and decoder use convolutional blocks which enforce the angular periodicity in the dataset.
  - Voxels at the center of the cylinder have a higher *coordination number.* Working on how to incorporate this info to the model.
- New encoder use hierarchy levels.
- This model will be used in the draft I'm working on.
- We have the code to use the flux biases as a proxy for high/low dwave biases => We can start working on the energy conditionalizing of the RBM.