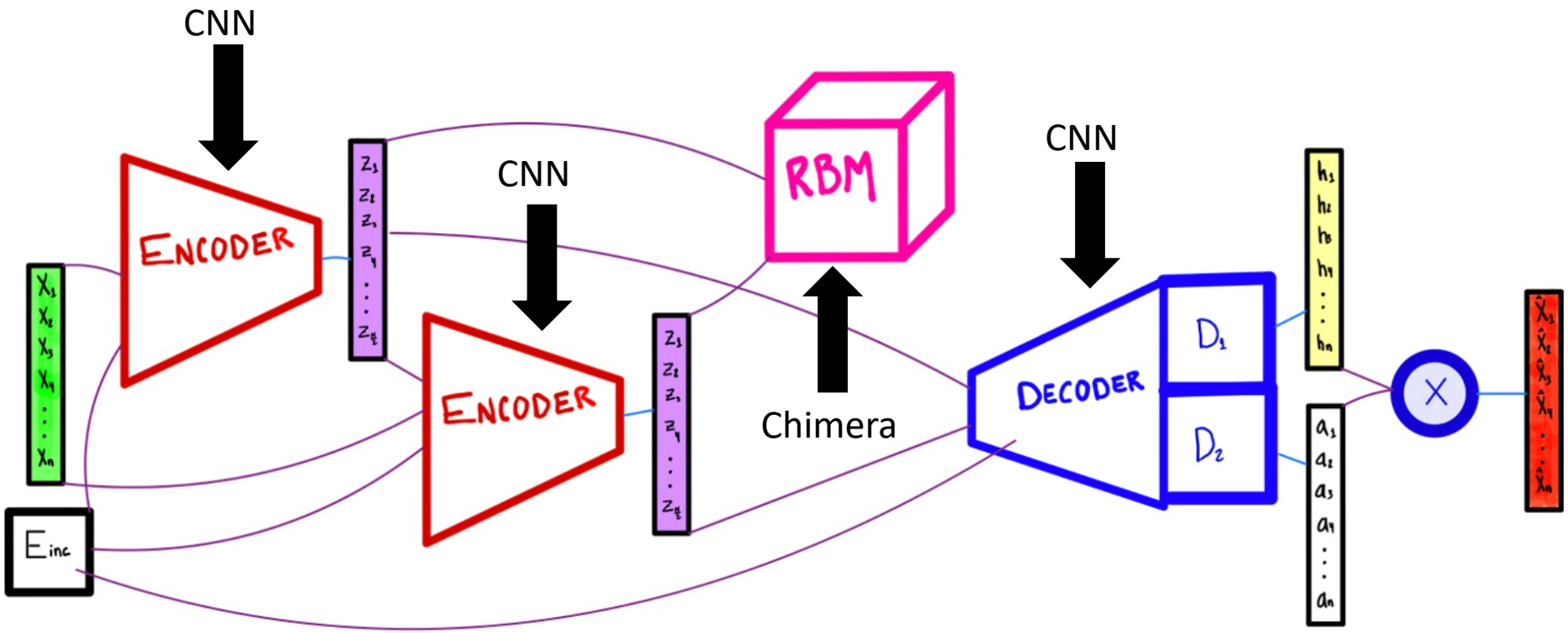
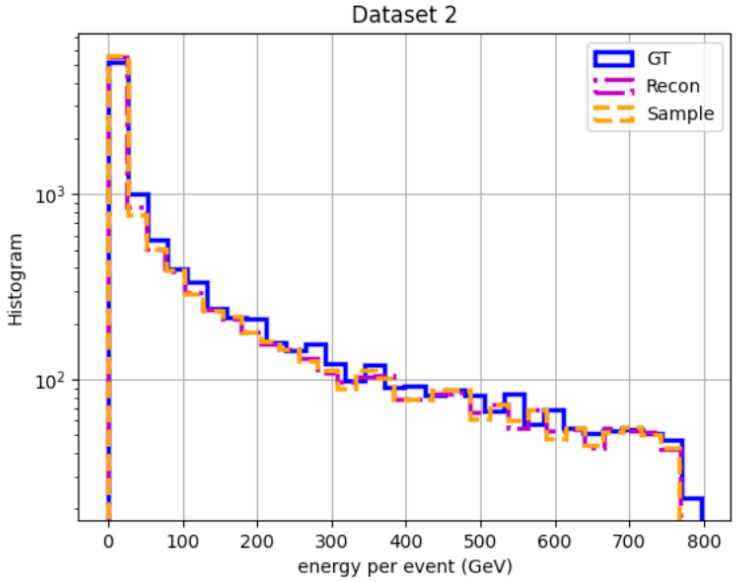
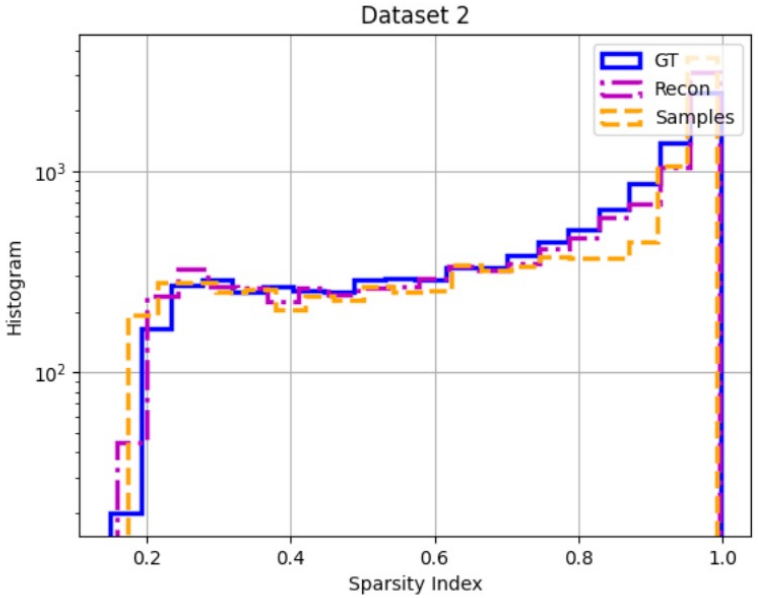
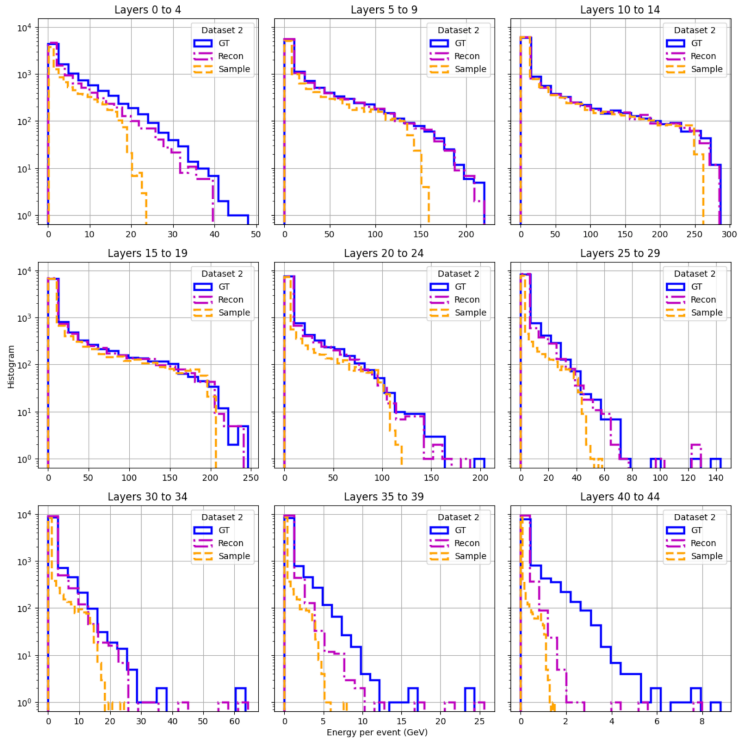
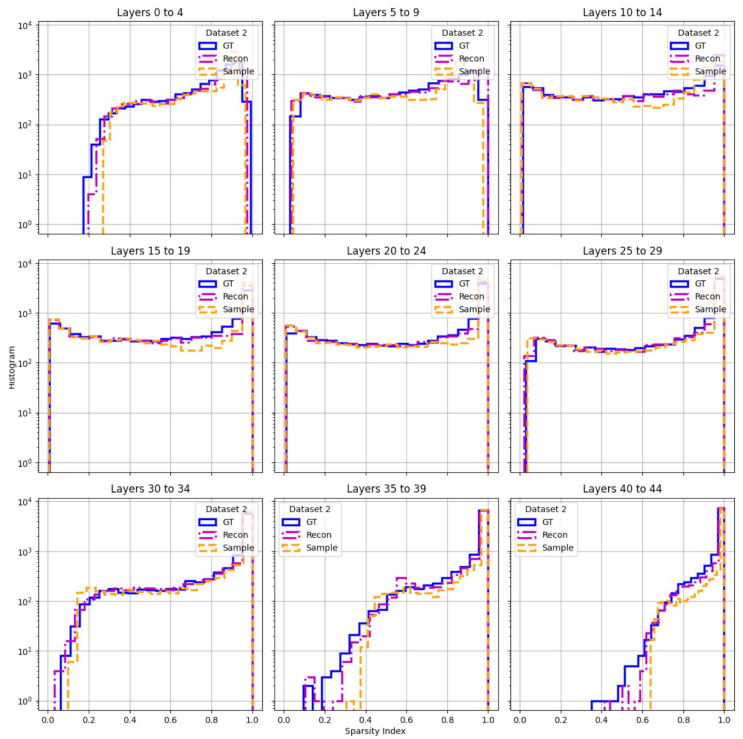
Model #1 – Energy-Conditioned Hierarchical CNN Encoder & Energy-Conditioned CNN Decoder



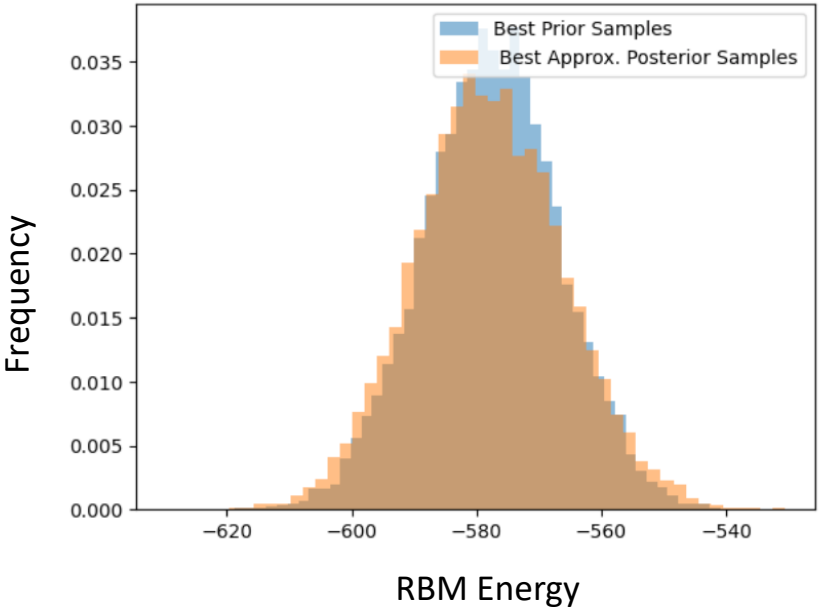




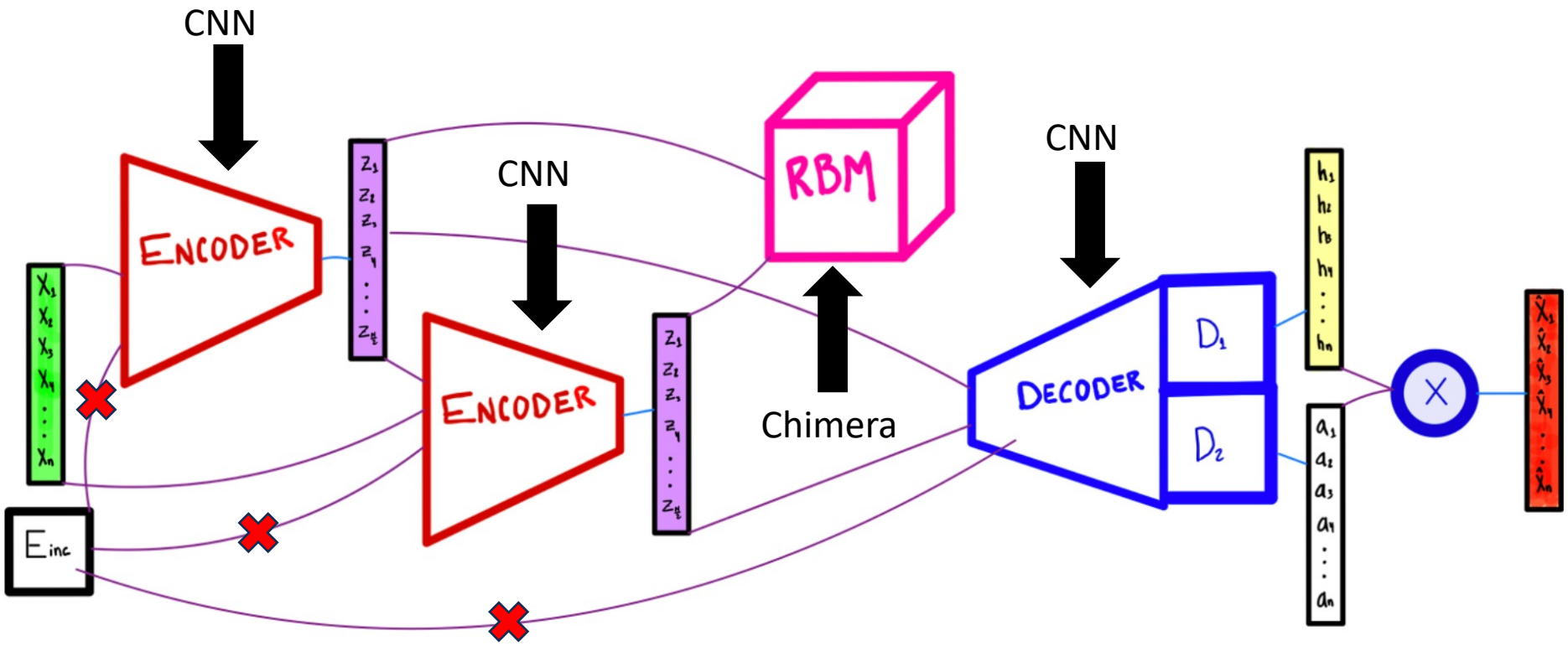




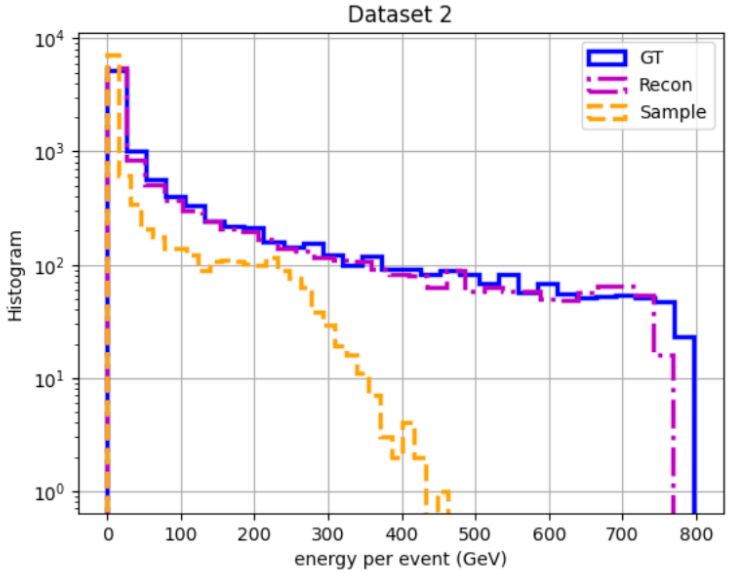
Note: Orange histogram corresponds to RBM energy evaluated over encoded data samples from approx. posterior. Blue histogram corresponds to RBM energy evaluated over samples generated via Gibbs sampling in latent space. We expect overlap between the two histograms for well-trained models

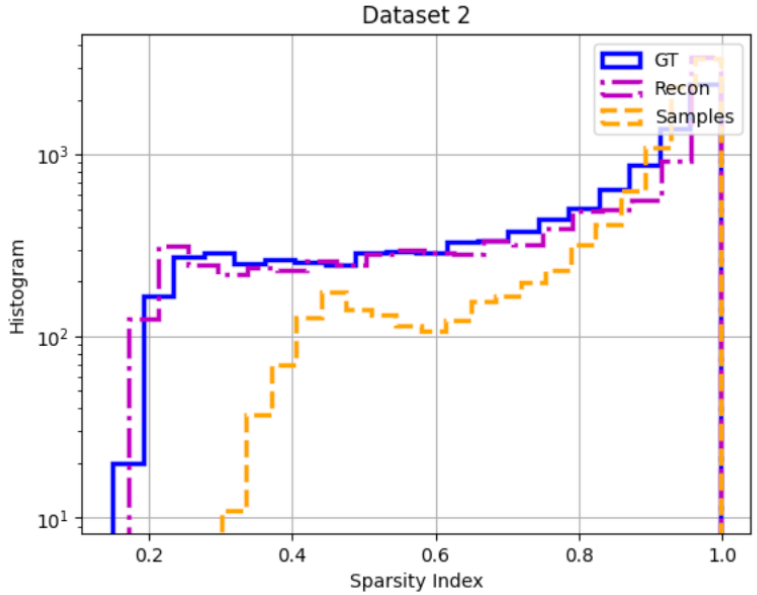


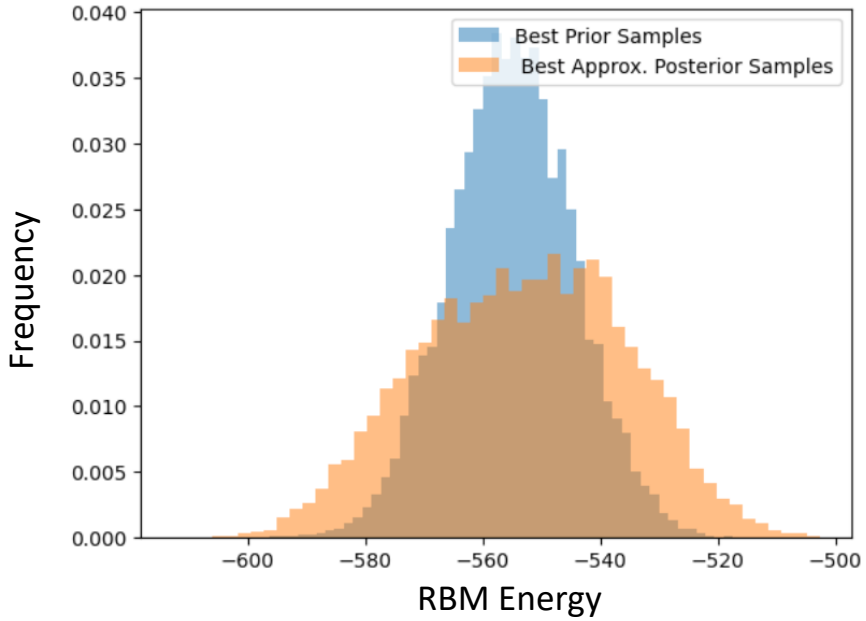
Model #2 – Unconditioned Hierarchical CNN Encoder & Unconditioned CNN Decoder

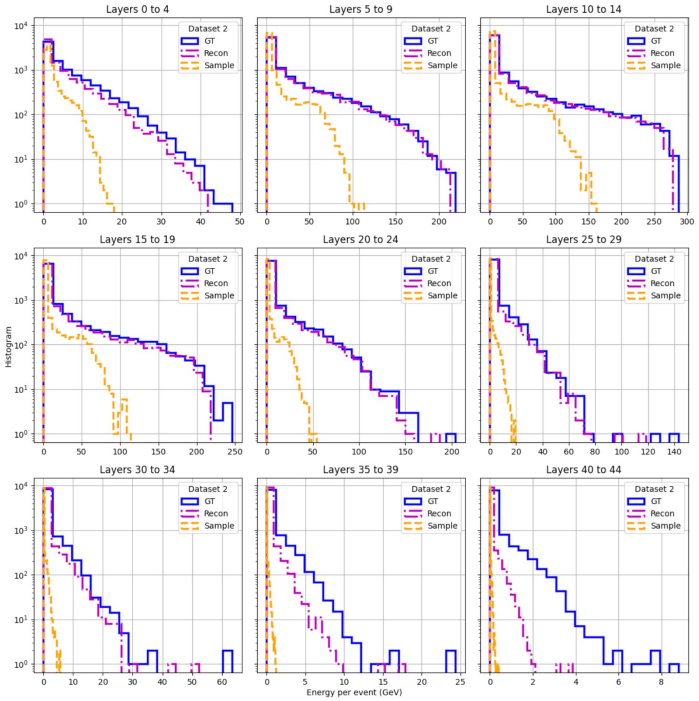


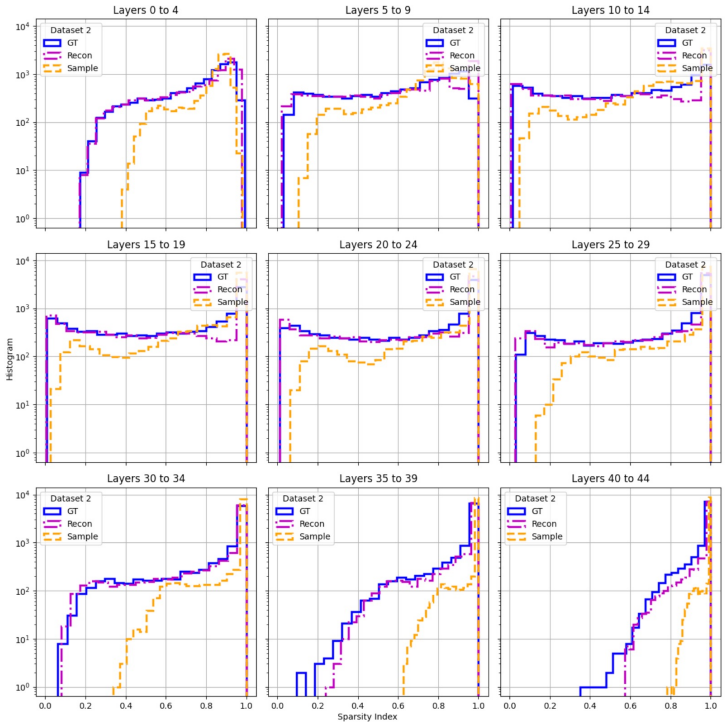
✖ Connection removed from model


Dataset 2
GT
Recon
Sample
Histogram
energy per event (GeV)

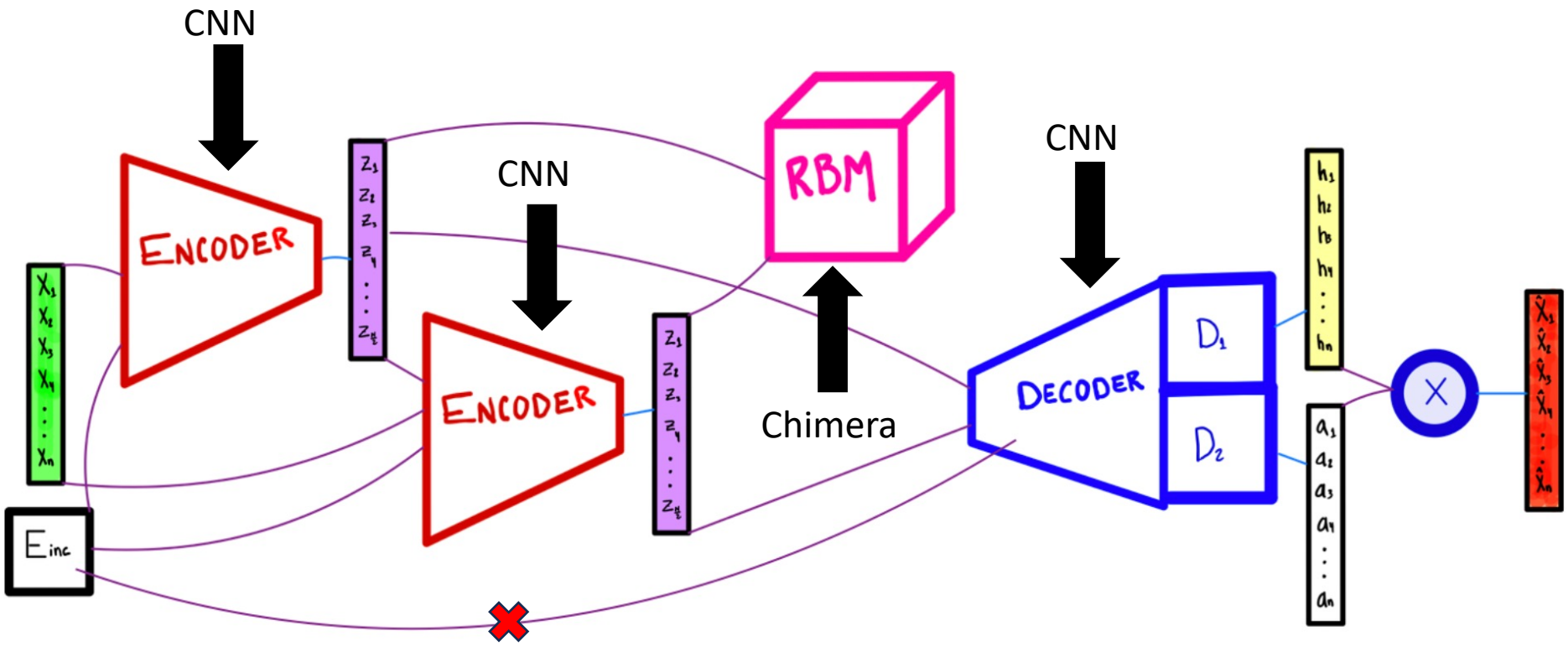

Dataset 2
GT
Recon
Samples
Histogram
Sparsity Index


Best Prior Samples
Best Approx. Posterior Samples
Frequency
RBM Energy

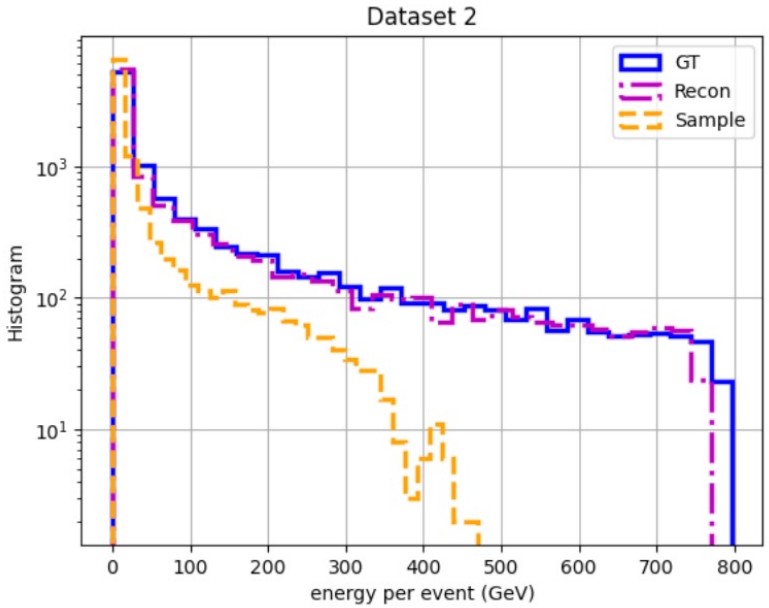

Layers 0 to 4
Layers 5 to 9
Layers 10 to 14
Layers 15 to 19
Layers 20 to 24
Layers 25 to 29
Layers 30 to 34
Layers 35 to 39
Layers 40 to 44
Energy per event (GeV)

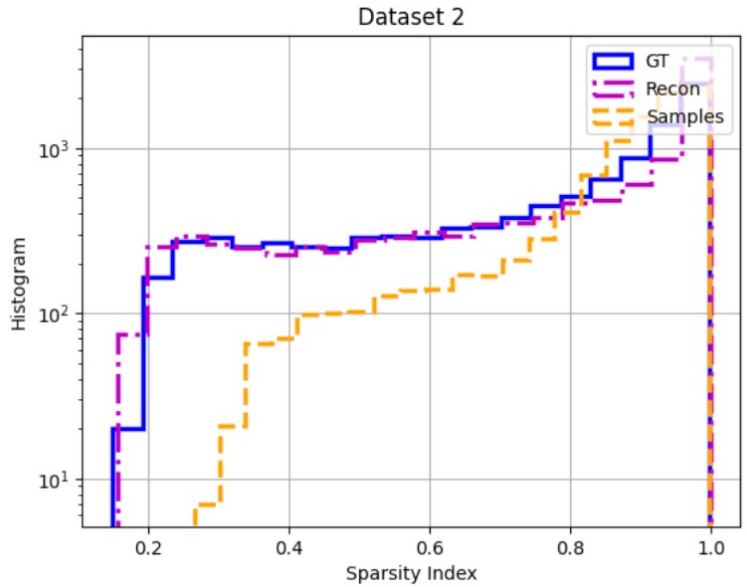

Layers 0 to 4
Layers 5 to 9
Layers 10 to 14
Layers 15 to 19
Layers 20 to 24
Layers 25 to 29
Layers 30 to 34
Layers 35 to 39
Layers 40 to 44
Sparsity Index

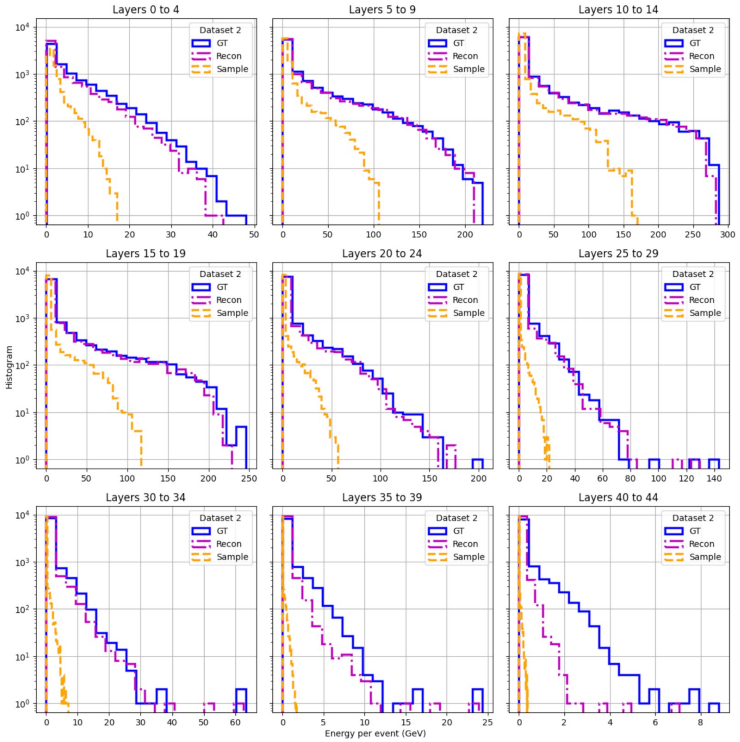
Model #3 – Energy-conditioned Hierarchical CNN Encoder & Unconditioned CNN Decoder

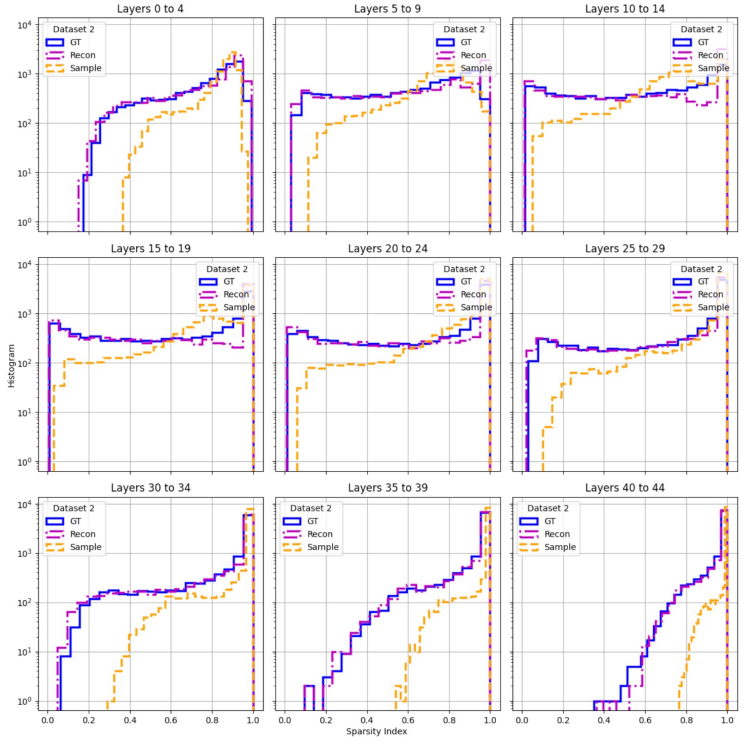


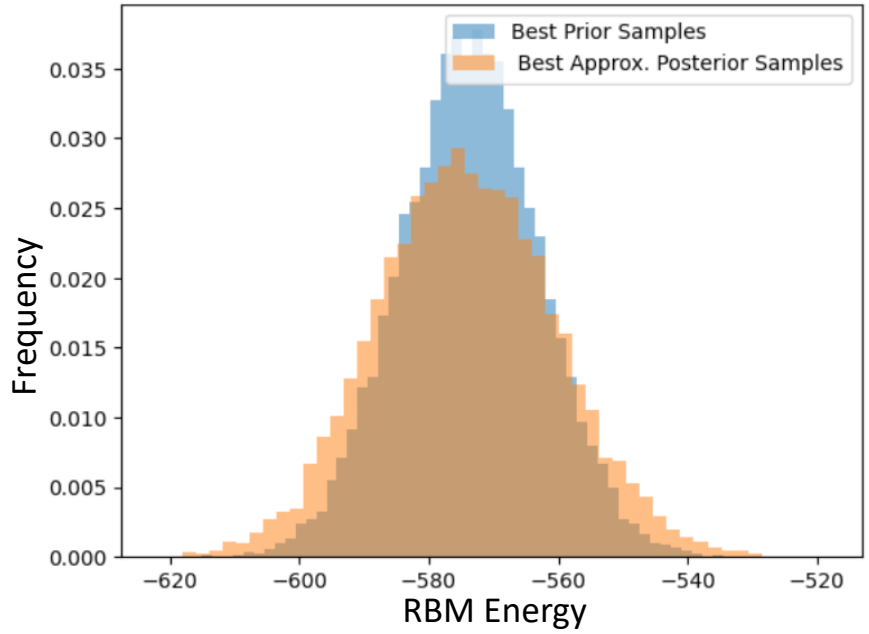
✖ Connection removed from model


Dataset 2
GT
Recon
Sample
Histogram
energy per event (GeV)

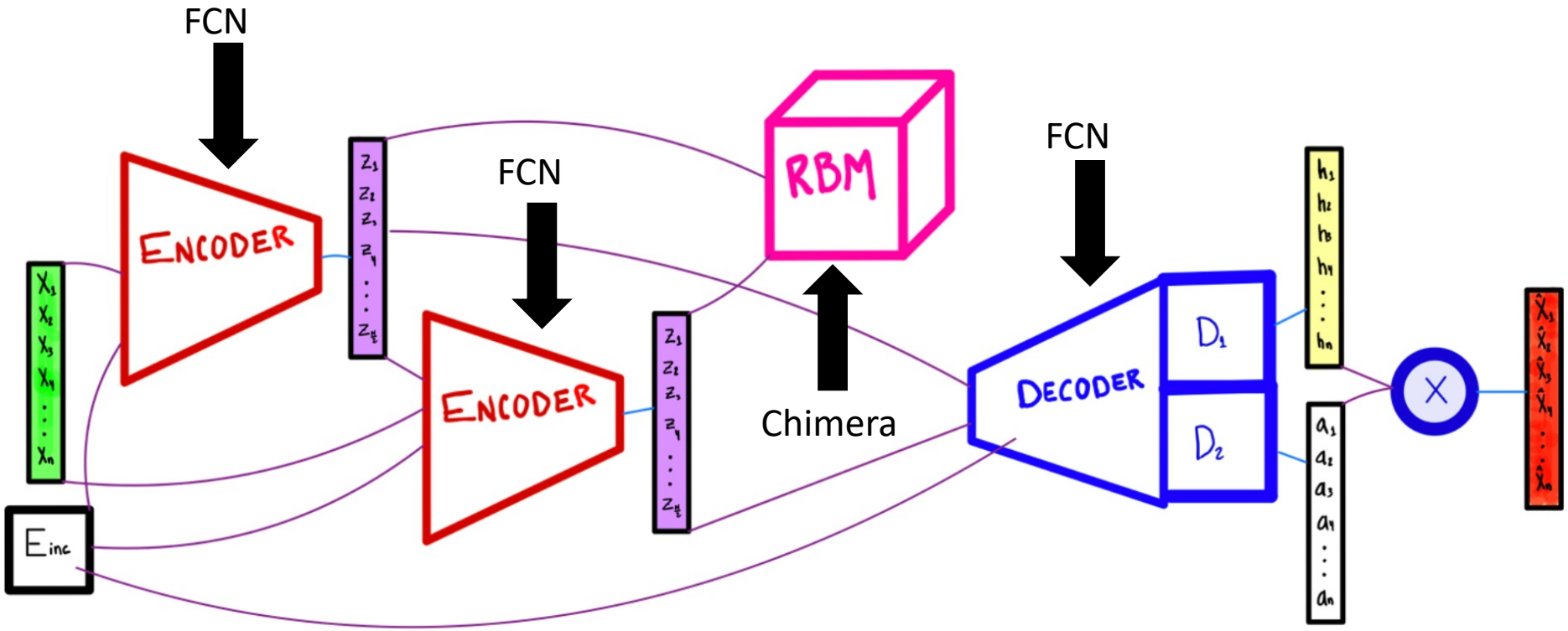

Dataset 2
GT
Recon
Samples
Histogram
Sparsity Index

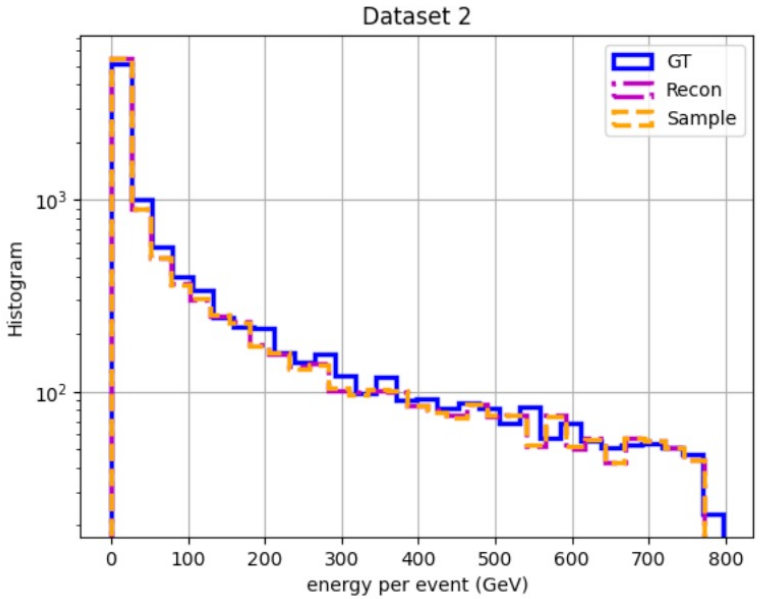

Layers 0 to 4
Layers 5 to 9
Layers 10 to 14
Layers 15 to 19
Layers 20 to 24
Layers 25 to 29
Layers 30 to 34
Layers 35 to 39
Layers 40 to 44
Dataset 2
GT
Recon
Sample
Histogram
Energy per event (GeV)

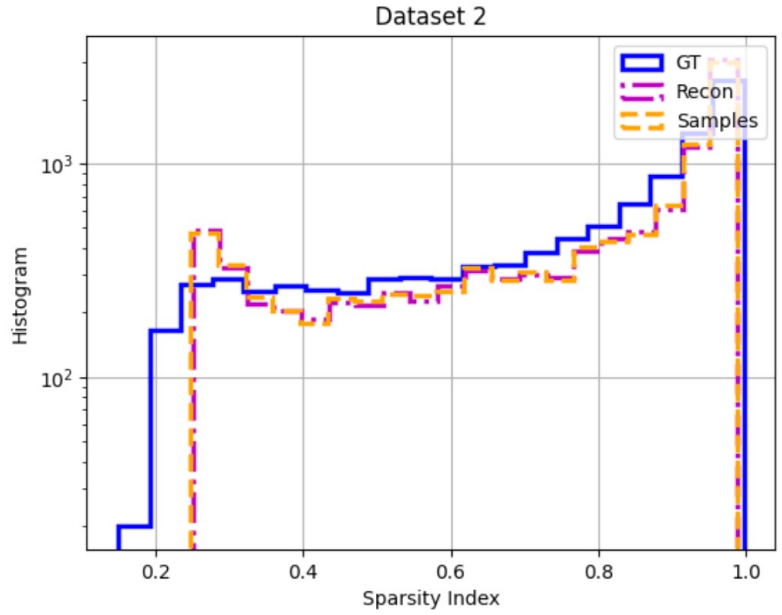

Layers 0 to 4
Layers 5 to 9
Layers 10 to 14
Layers 15 to 19
Layers 20 to 24
Layers 25 to 29
Layers 30 to 34
Layers 35 to 39
Layers 40 to 44
Dataset 2
GT
Recon
Sample
Histogram
Sparsity Index

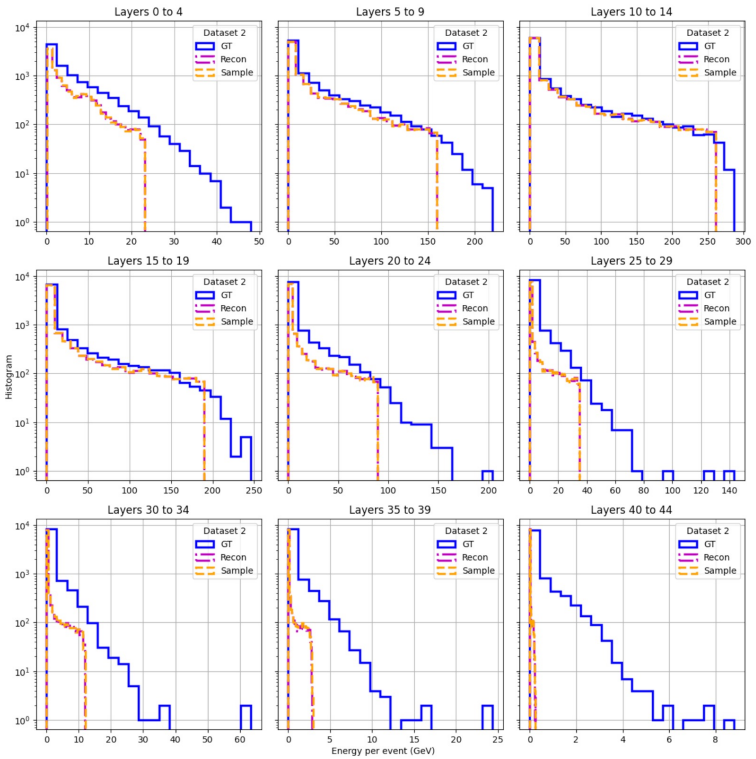

Best Prior Samples
Best Approx. Posterior Samples
Frequency
RBM Energy

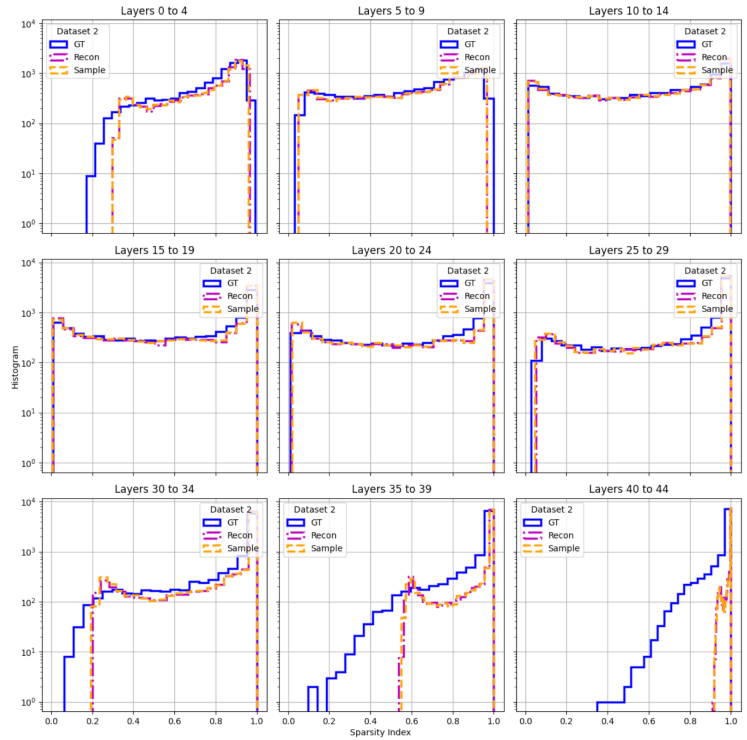
Model #4 – Energy-conditioned Hierarchical FCN Encoder & Energy-conditioned FCN Decoder

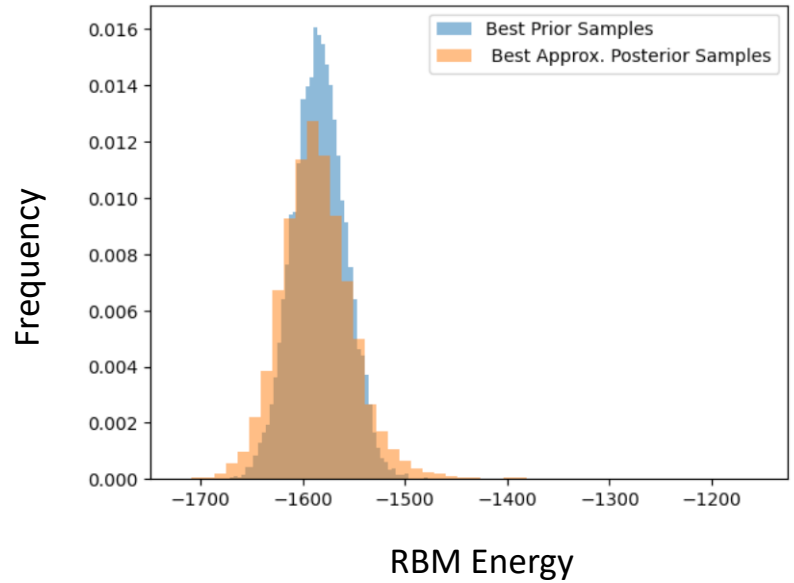



Dataset 2
GT
Recon
Sample
Histogram
energy per event (GeV)

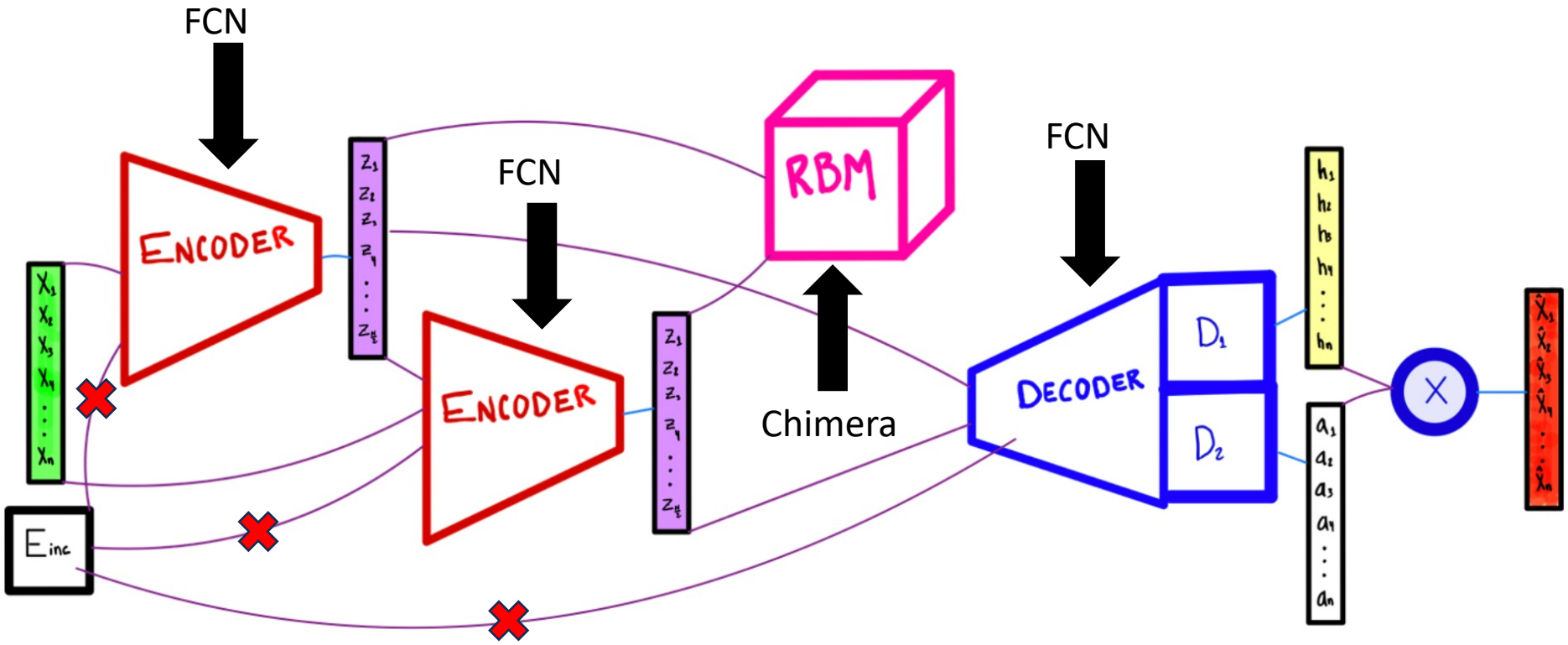

Dataset 2
GT
Recon
Samples
Histogram
Sparsity Index


Layers 0 to 4
Layers 5 to 9
Layers 10 to 14
Layers 15 to 19
Layers 20 to 24
Layers 25 to 29
Layers 30 to 34
Layers 35 to 39
Layers 40 to 44
Dataset 2
GT
Recon
Sample
Histogram
Energy per event (GeV)

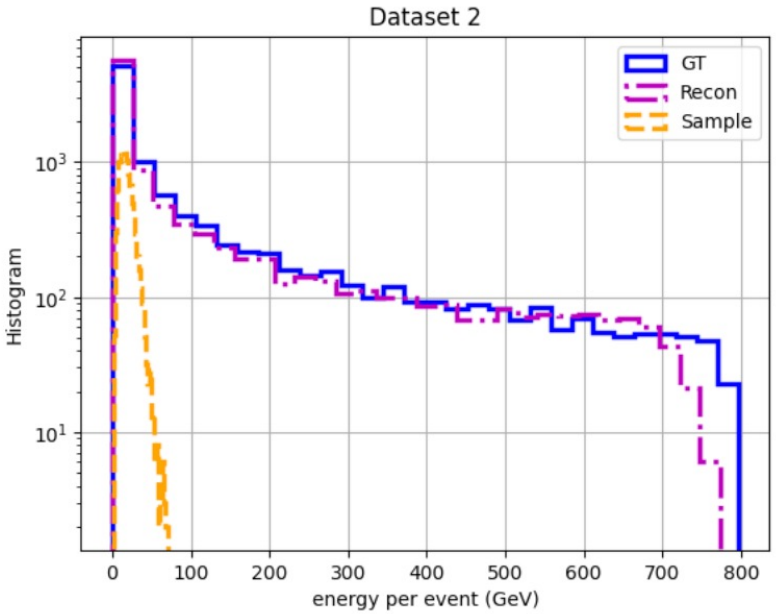

Layers 0 to 4
Layers 5 to 9
Layers 10 to 14
Layers 15 to 19
Layers 20 to 24
Layers 25 to 29
Layers 30 to 34
Layers 35 to 39
Layers 40 to 44
Dataset 2
GT
Recon
Sample
Histogram
Sparsity Index

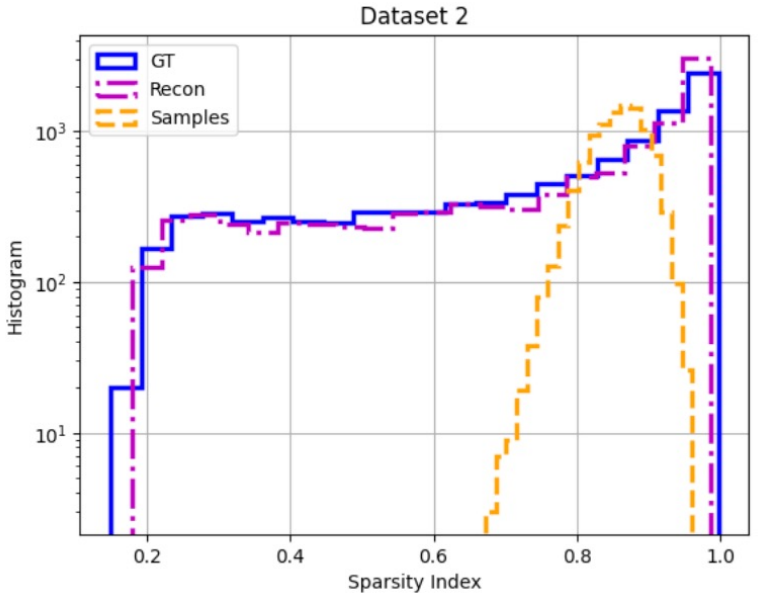

Best Prior Samples
Best Approx. Posterior Samples
Frequency
RBM Energy

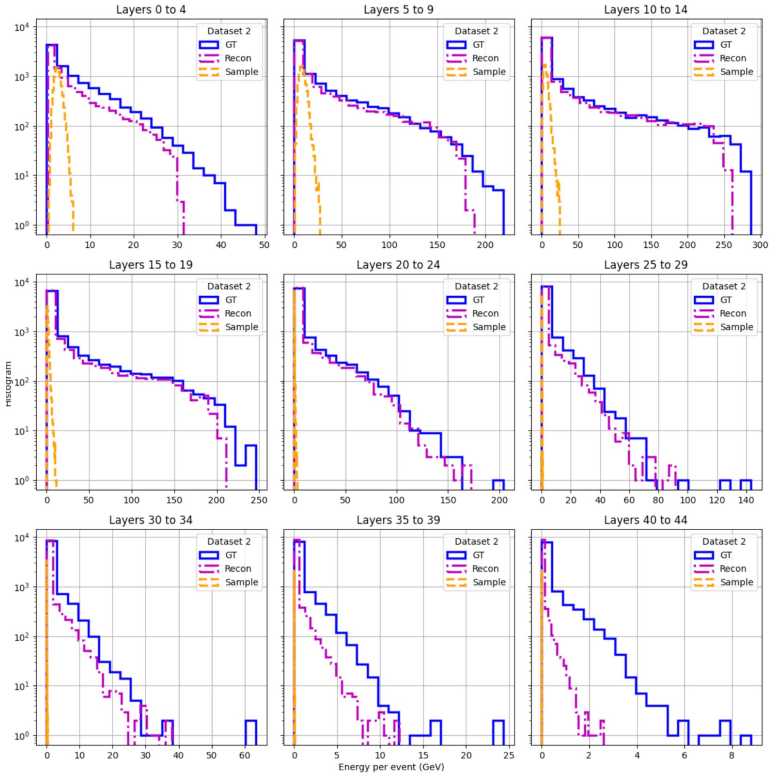
Model #5 – Unconditioned Hierarchical FCN Encoder & Unconditioned FCN Decoder

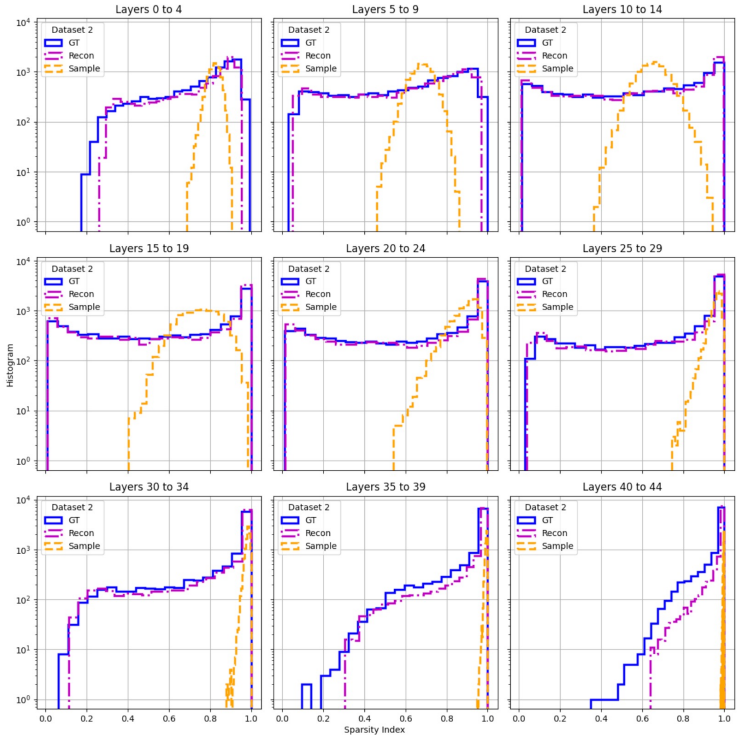


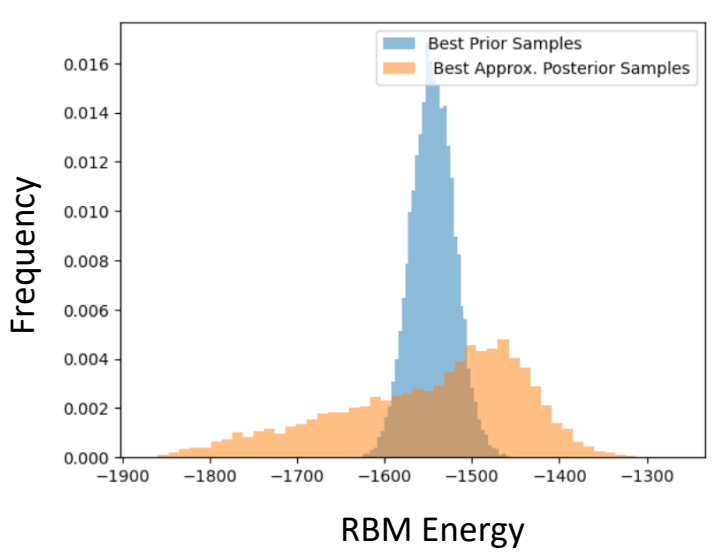
✖ Connection removed from model


Dataset 2
GT
Recon
Sample
Histogram
energy per event (GeV)


Dataset 2
GT
Recon
Samples
Histogram
Sparsity Index


Layers 0 to 4
Layers 5 to 9
Layers 10 to 14
Layers 15 to 19
Layers 20 to 24
Layers 25 to 29
Layers 30 to 34
Layers 35 to 39
Layers 40 to 44
Dataset 2
GT
Recon
Sample
Histogram
Energy per event (GeV)


Layers 0 to 4
Layers 5 to 9
Layers 10 to 14
Layers 15 to 19
Layers 20 to 24
Layers 25 to 29
Layers 30 to 34
Layers 35 to 39
Layers 40 to 44
Dataset 2
GT
Recon
Sample
Histogram
Sparsity Index


Best Prior Samples
Best Approx. Posterior Samples
Frequency
RBM Energy