



Week 3

Presentation

PHY 496

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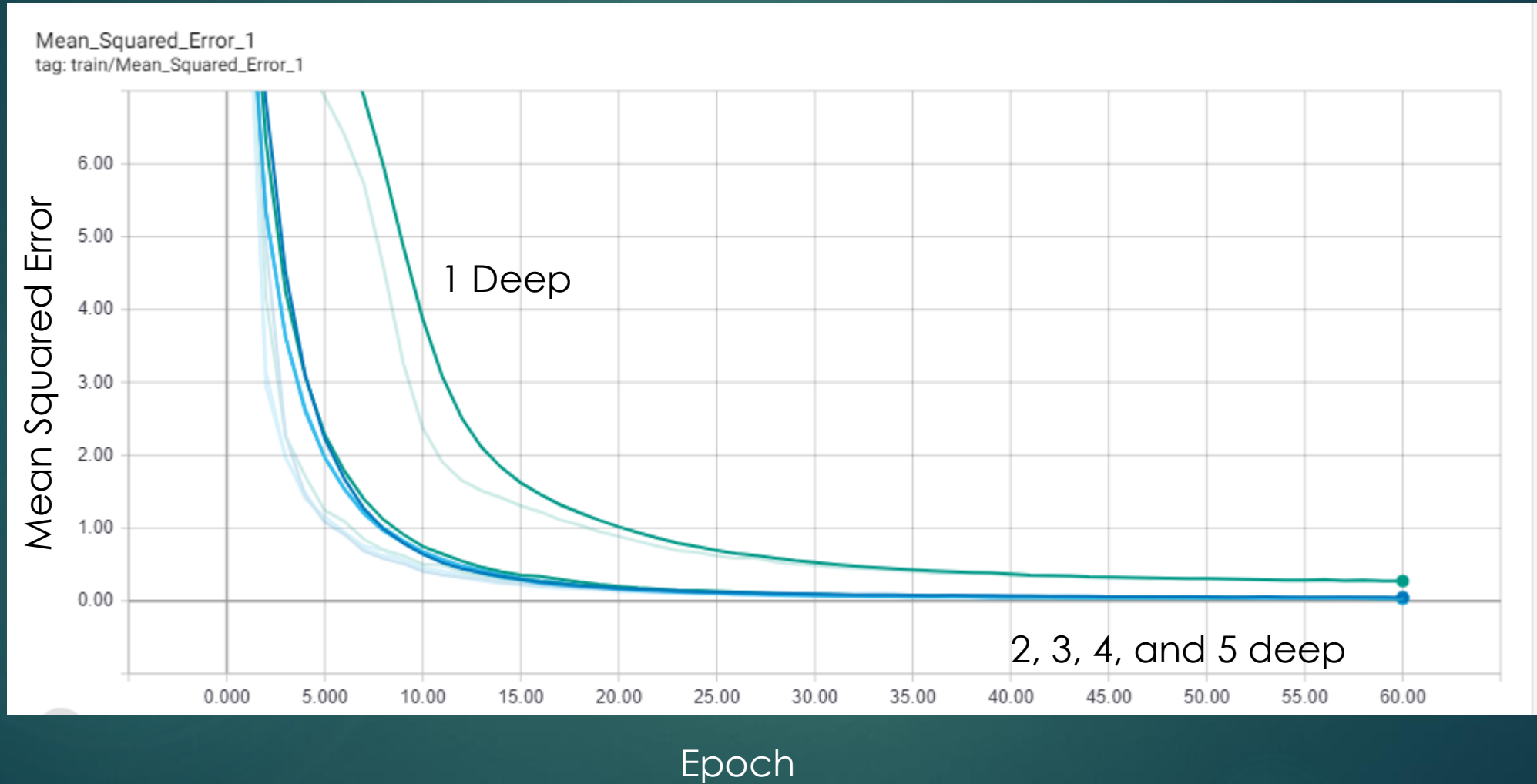
Data Summary

- ▶ 19 input values, scaled from -1 to 1
 - ▶ pMSSM parameters
- ▶ 1 output value, normalized by taking the log of the value and then fitting to a normal distribution
 - ▶ Probability of making supersymmetric particles
- ▶ 96, 952 data points total

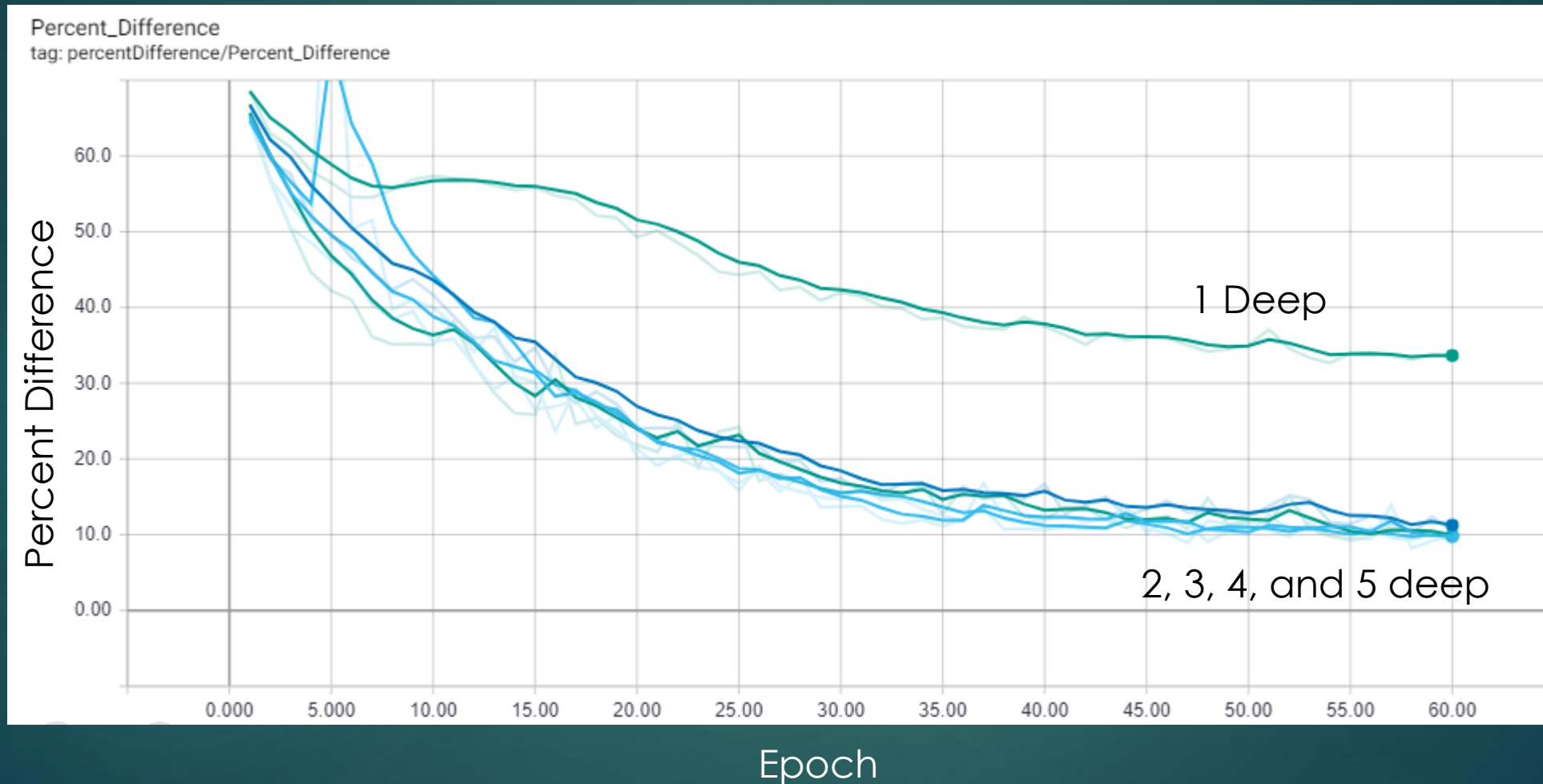
Neural Network Summary

- ▶ Variable number and variable width Dense Dropout Layers from Tensorflow-Probability
- ▶ Leaky-Relu activation on hidden layers, no activation on output
- ▶ Mean Squared Error loss function
- ▶ Adam Optimizer with the default values from Tensorflow
- ▶ Batch size of 128
- ▶ 80% of data is training, 20% is validation

Loss Minimization



Percent Difference Minimization



Optimization summary

Depth	Width	% Difference	Loss
1	100	33.67%	0.2676
2	100	10.50%	0.04622
3	70	9.427%	0.03363
4	40	9.796%	0.03214
5	40	9.118%	0.02408

Goals for next week

- ▶ Examine impact of different activation functions
- ▶ Tweak batch size and training rate values
- ▶ Create an operation to run the network about 100 times and compare that actual value to the mean and standard deviation of the output