

ML4Science

Week 3

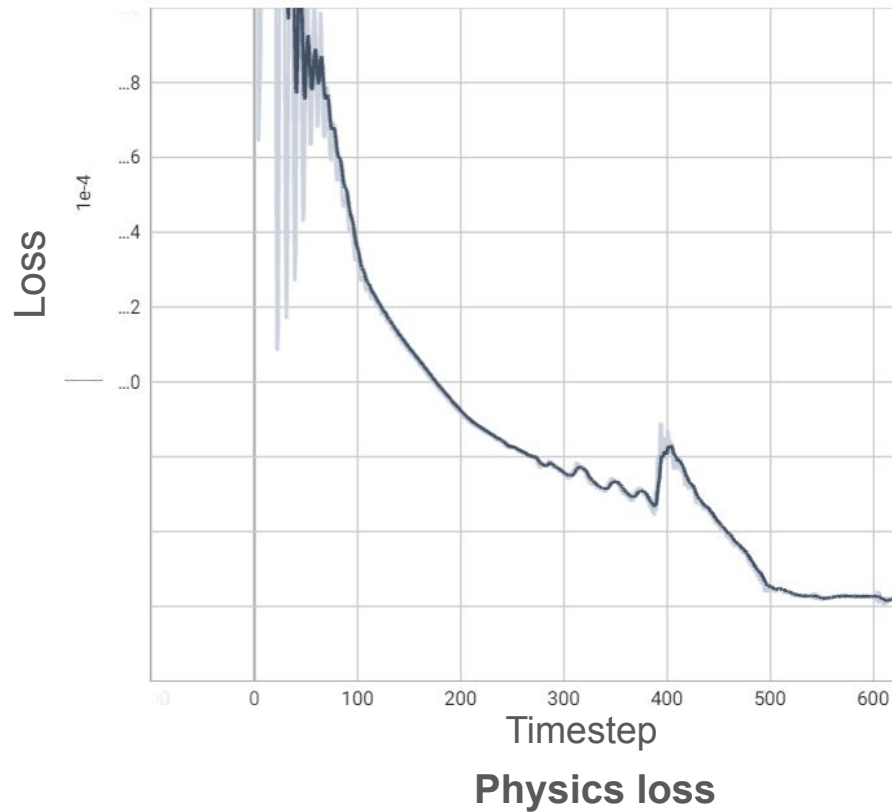
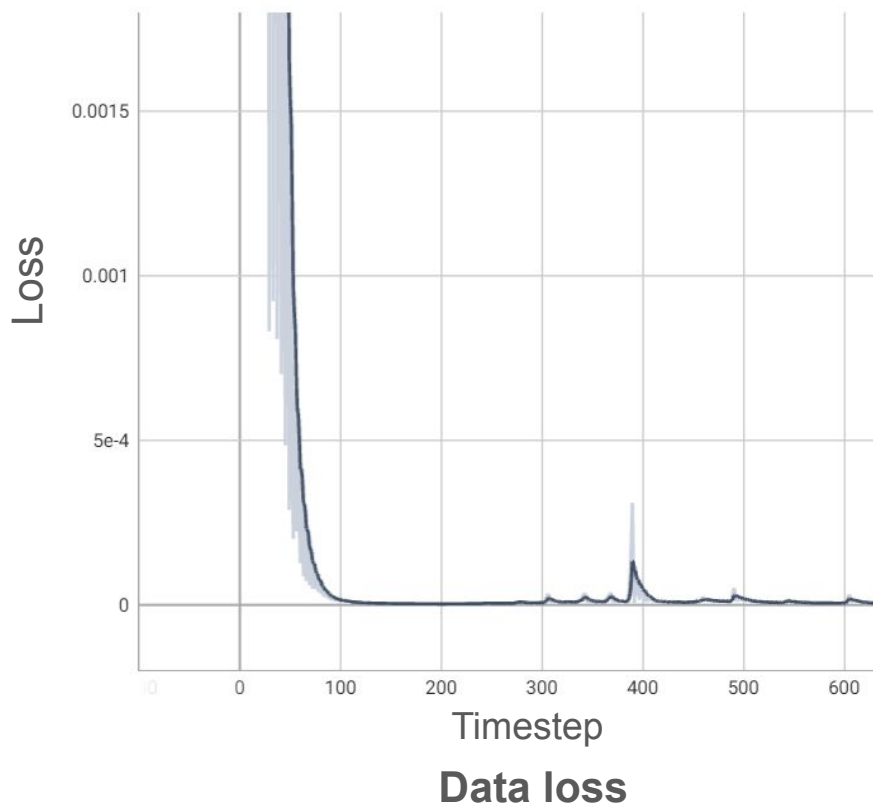
What we did

- finalize code structure

This included:

- changing evaluation while training (added logging)
 - adding evaluation on test (R^2 score)
- experimented with different setups

Visualizations to control the training process

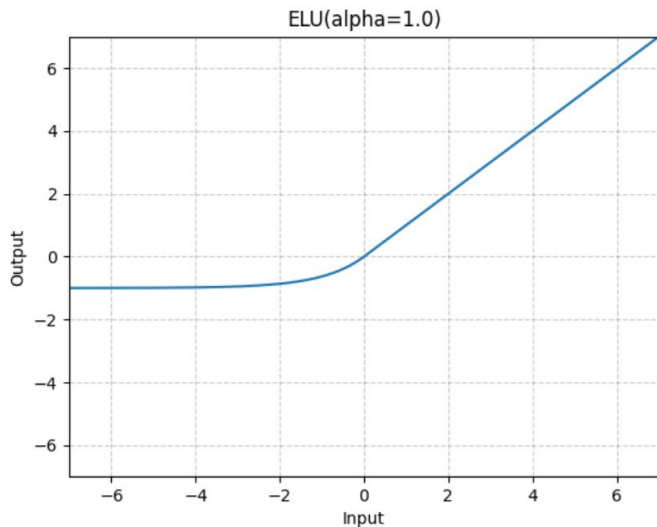


The motivation behind different activations

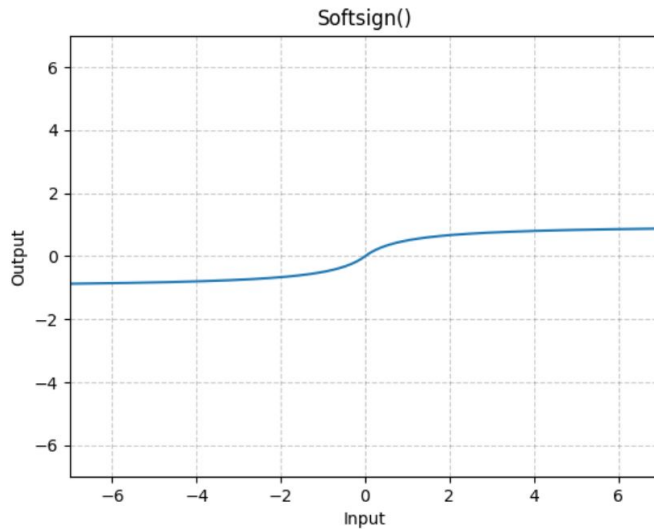
Boundary conditions for ODE:

1. reionization rate=0, $T=0$

2. reionization rate \rightarrow const, $T \rightarrow \infty$



ELU activation



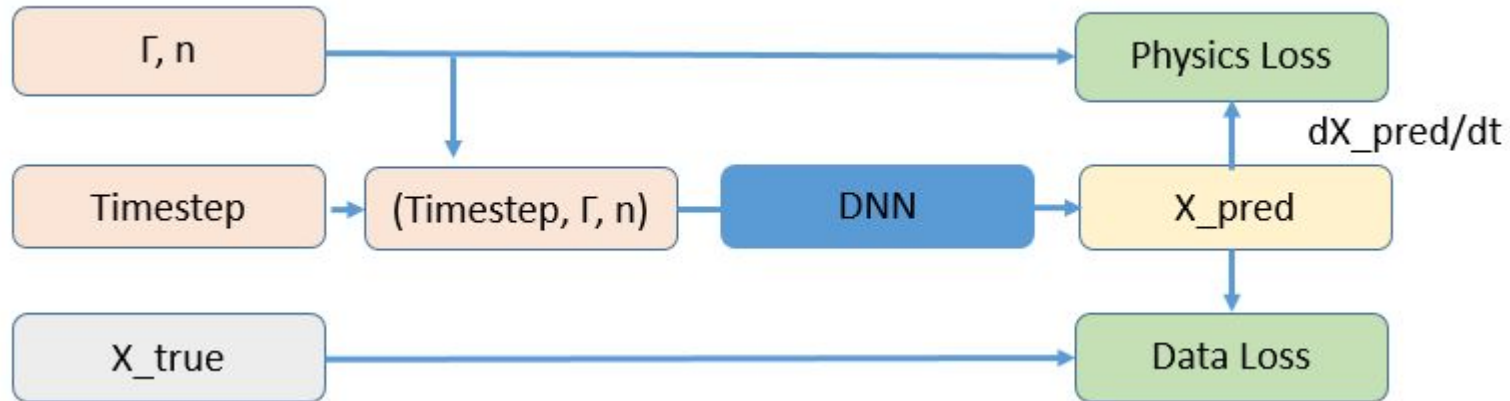
SoftSign activation

Results

PhysicsLoss	Physics Loss Coef	ELU	Softsign	Epochs	R2_Score
No	/	Yes	No	5000	-0.0216
Yes	1.0	Yes	No	1000	0.8409
Yes	1.0	No	Yes	1000	-0.0933
Yes	1.0	Yes	Yes	1000	0.8773
Yes	1e-4	Yes	Yes	1000	0.8869
No	/	Yes	Yes	1000	0.9201
Yes	8.0	Yes	Yes	1000	0.8639

Plan for the coming week

- hyperparameter tuning
- Implement handling of different *Gamma* and *n* values



Our suggestion on handling Γ, n