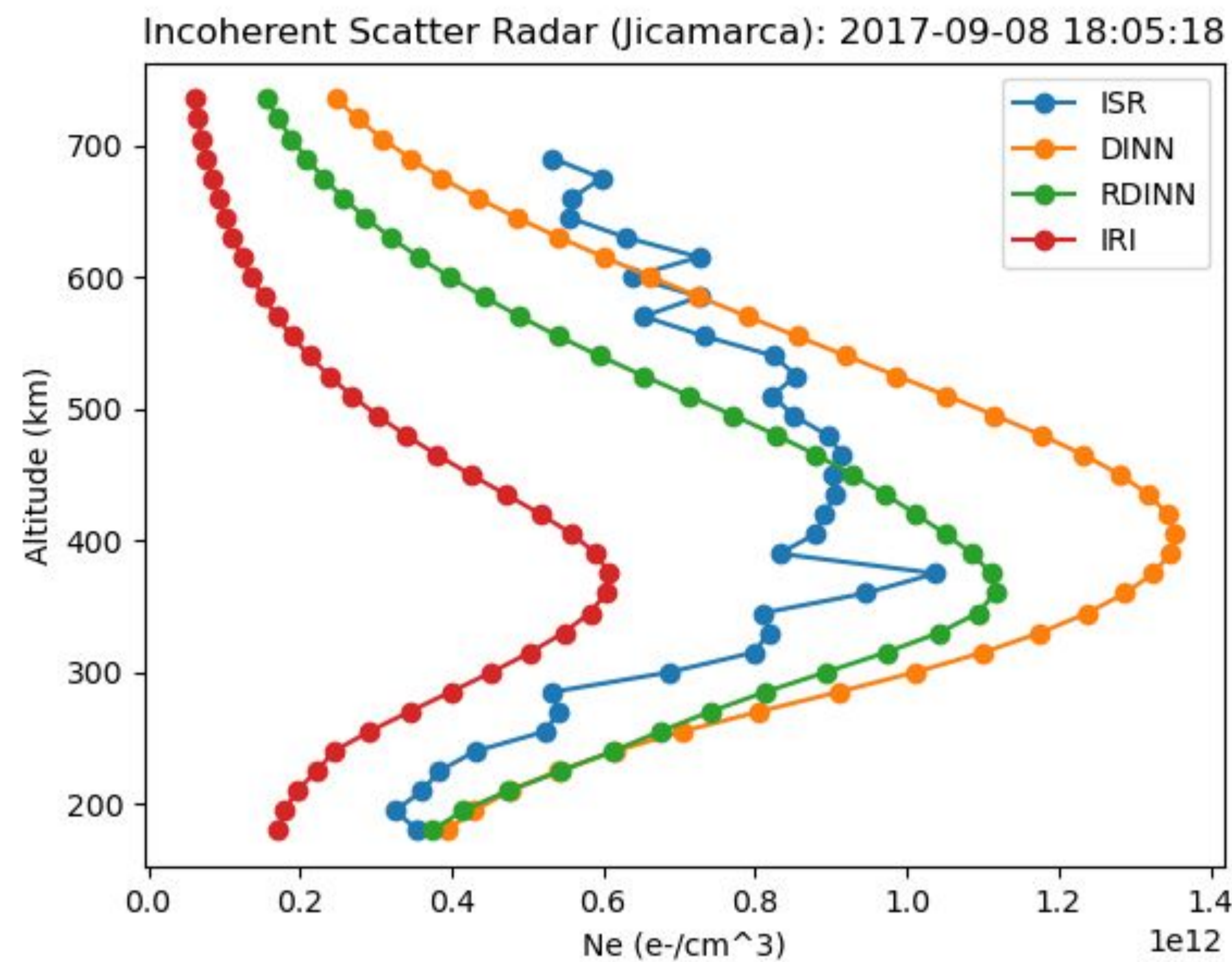
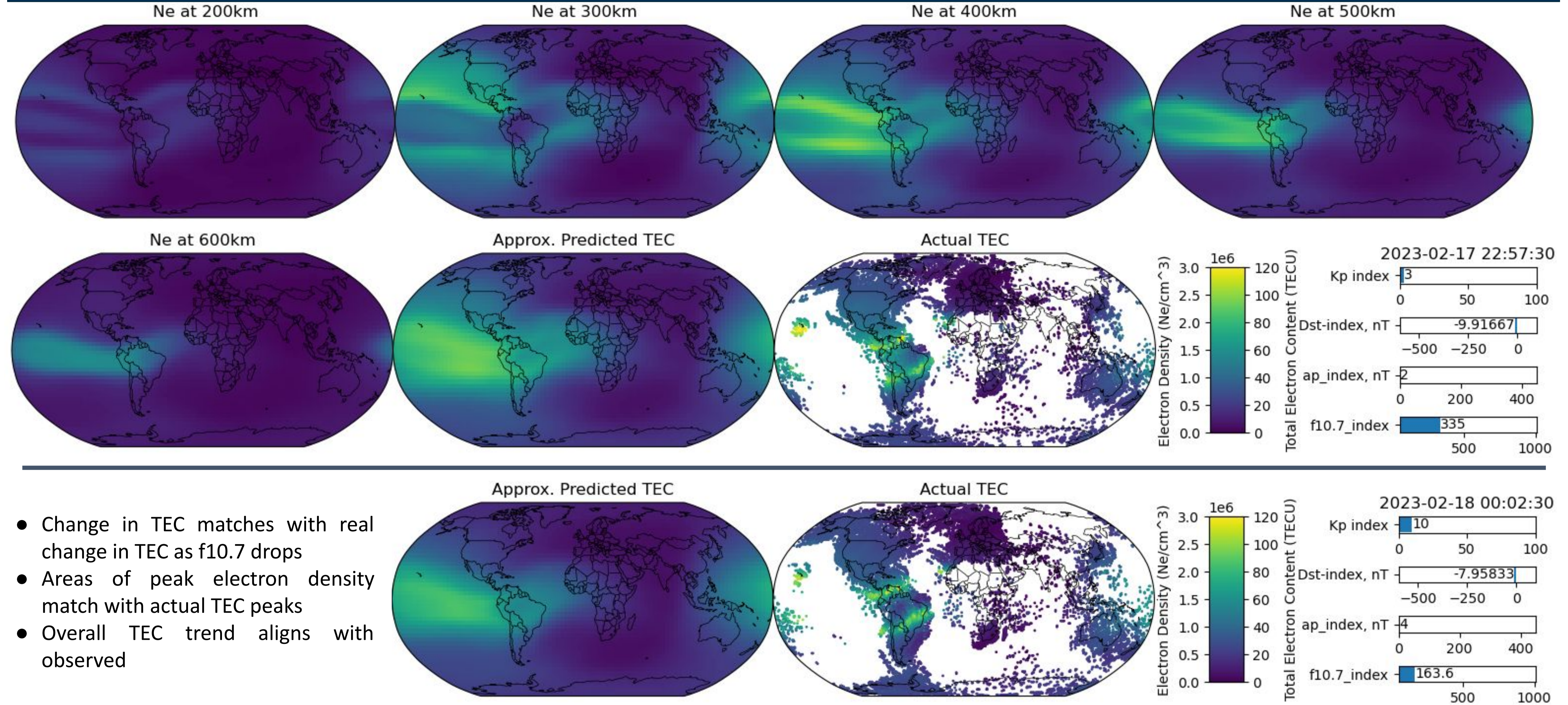


Electron Density Profile Example

- Model predicts reasonable electron density profiles
- Model often meets or exceeds accuracy of IRI on test data

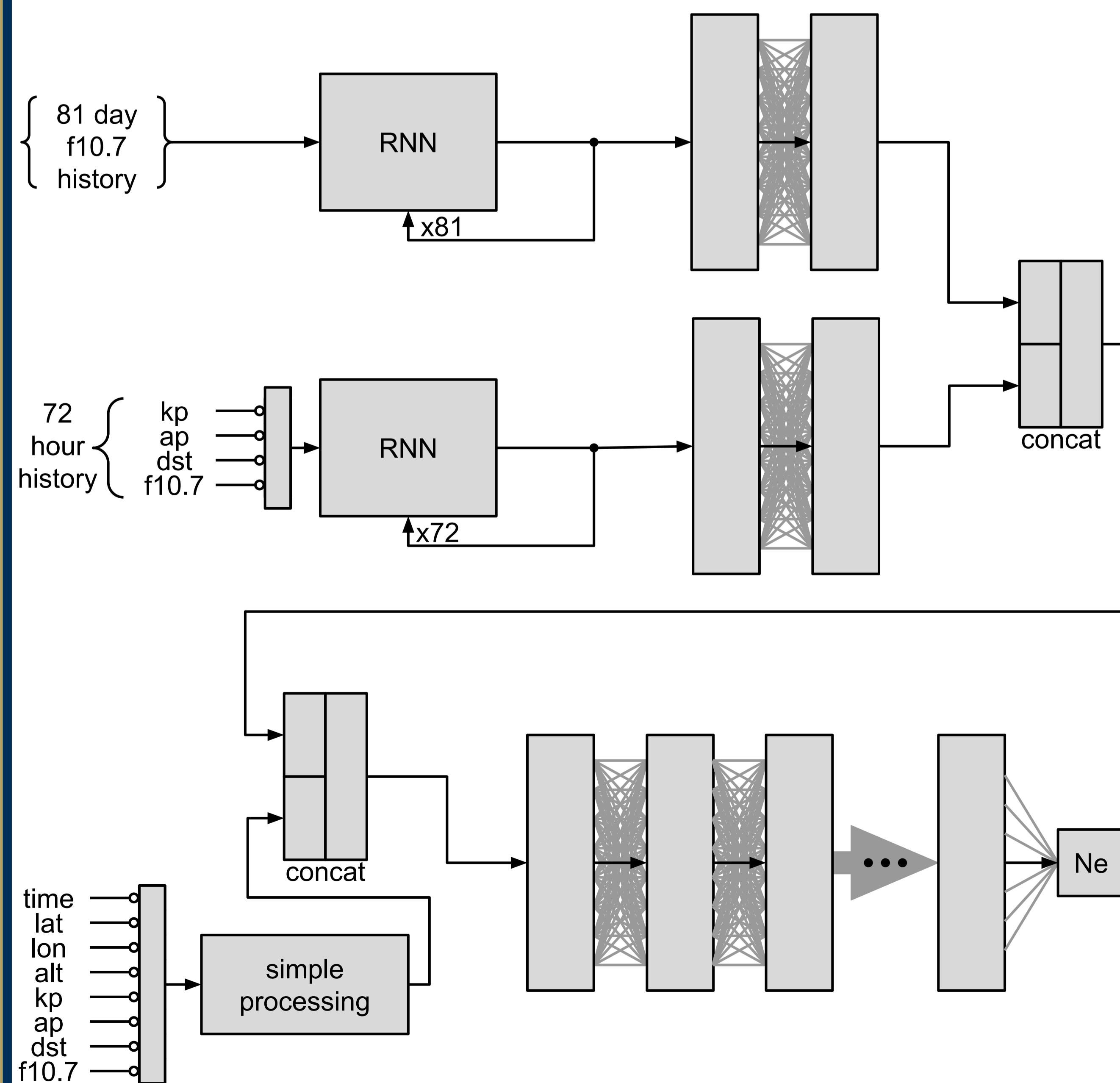


Storm-Time TEC Performance



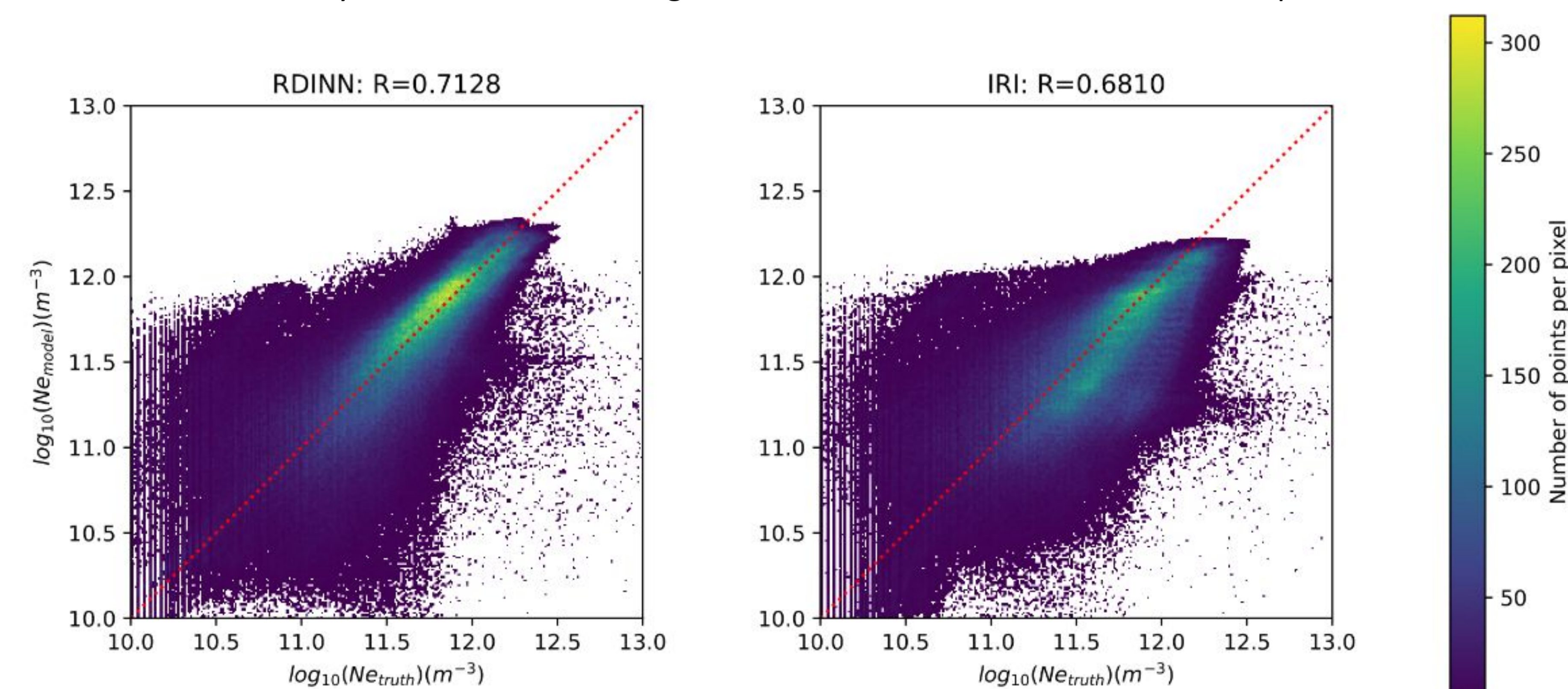
- Change in TEC matches with real change in TEC as f10.7 drops
- Areas of peak electron density match with actual TEC peaks
- Overall TEC trend aligns with observed

Model Architecture



Comparison to IRI

We compare our model's performance against the International Reference Ionosphere (IRI) on data measured differently than how our training data was measured and observe better performance.



Summary

- An RNN-based model has been developed that outperforms non-RNN models (not shown here)
- The model is currently trained on GPSRO data only
- Performance is comparable and sometimes in excess of IRI performance
- Estimated TEC based on model predictions matches well with measured TEC
- Further adjustments are planned to improve the model
 - CNN techniques
 - Missing-compliant training
 - Fusion with physics-based modeling
 - Use of non-electron density training data for improved performance (such as TEC)
 - Incorporation of additional indices and other related observed values