The paper proposes an innovative method that combines Bayesian interpolation (BI) and basic Multi-Layer Perception (MLP) to map refractivity from Global Navigation Satellite Systems (GNSS) radio occultation (RO) data, i.e., COSMIC-2. While the study suggests that the BI&ML model outperforms individual BI and MLP models, there are some concerns regarding the presented conclusions.

Review Comments:

1. Training Consistency: The paper suggests that BI&ML outperforms MLP alone, but upon examining tables 1 and 2, the difference does not appear significant. It is common knowledge that the performance of the MLP model is tied to its initial state and training quality. To address this concern, it is recommended that the author trains multiple models for all methods to provide a clearer understanding of uncertainty associated with each model.

2. Hyperparameter Tuning: Figure 2 illustrates hyperparameter tuning on wandb, which is commendable. However, it would be beneficial to explore more critical hyperparameters, such as the optimization method (e.g., Adam, AdamW, RMSprop), number of layers, and weight decay. These parameters are likely to have a more substantial impact than batch size, epochs, and learning rate.

3. Data Preprocessing: The paper does not explicitly mention any preprocessing steps for COSMIC-2 data. It would be insightful to provide details on any preprocessing carried out, as this could significantly influence the model's performance.

4. Data Splitting Strategy: Randomly splitting data into train, valid, and test sets might not be optimal, as these sets could be interrelated (so called ‘data leaking’). The suggestion is to have an independent validation set and test set for a more robust evaluation of the proposed models.

5. Code and Data Availability: To enhance the reproducibility and validation of the research, it is recommended that the authors provide complete code and data. This would enable other researchers to replicate the experiments more easily and validate the results effectively.