

# ***Interactive comment on “RainNet v1.0: a convolutional neural network for radar-based precipitation nowcasting” by Georgy Ayzel et al.***

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Received and published: 13 April 2020

## **General comments**

The paper presents a deep-learning based model for the nowcasting of radar-based precipitation fields. While the novelty from the architectural point of the deep learning modeling is limited (an adaptation of the U-Net architecture), the paper makes a very good case for the application of a tried-and-true deep learning architecture to the domain of radar-based precipitation nowcasting. Overall, the presented work is very well written: the relevant concepts and references are introduced, the evaluation framework along with experimental setup and analysis is presented with clarity, and the model results are compared with proper baselines using both continuous (MAE) and

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categorical scores (CSI, FSS). The discussion addresses the main challenge posed by deep learning nowcasting models: the smoothing of the predicted precipitation field over time. Last but not least, the supplementary material provides the model code, the data, the trained weights and a ready to use Colab notebook for reproducibility. Therefore, I recommend this study for publication after considering the minor comments listed below.

### Specific comments

1. L: 167-172 can you provide the exact number of the train (optimization), validation and test (verification) sequences? Moreover, can you explain how are the sequences extracted from the dataset (are the sequences extracted using an overlapping rolling window over the selected time periods?)
2. Given the analysis of the power spectrum and the reported smoothing in the prediction, it seems that RainNet may suffer from a severe underestimation of high rainfall rates. In this regard, it would be extremely beneficial to include a higher rain rate than 5mm/h for the analysis of the categorical scores. This would also help provide a better comparison with Rainymotion and can help to answer Line 230 that states: "RainNet might have difficulties in predicting pronounced precipitation features with high intensities". Thus, I suggest adding also at least one heavy rainfall threshold (FSS and CSI  $\geq$  15 mm/h) in the analysis.

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Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2020-30>, 2020.

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