

The paper reports the comparison of three deep learning architectures to estimate high-resolution precipitation. Three areas within CONUS are selected, one used for training, one for training and validation, and the last one used only for testing. This ensures independency of the test database, also assessing the model capability to cope with geographical variations.

The introduction is clear, addressing the main literature gaps and paper objectives. Methodology is well structured, too, and includes all relevant aspects of the adopted strategy.

The results are complete but quite long.

Overall, the paper is robust and interesting, as it also include a comparison of computational requirement, which can play a role in the choice of the suitable architecture. My main suggestion is to consider to make results a bit more concise, and to use comparative tables rather than images that contain numerical values.

Additionally, discussion does not make reference to other references, so it is not possible to contextualize results.

Minor comments:

- 1) Overall, there are some typos/misalignments in the equation symbols (e.g. Eq. 5 and 7: $t=1$ and $s=1$ are not perfectly visible, mean symbol is not clear in Eq. 18, parentheses and brackets misalignments elsewhere).
- 2) Eq. 19: if I am not wrong, ϵ is not defined.
- 3) Figure S2 is presented in the supplementary material, but is discussed in the paper (e.g., Figures S1, S2). This makes reading a bit complicated. Isn't it possible to include quantitative evaluation of the training behavior, to avoid the reader to refer to an image not included in the main text?
- 4) Figure S3a is recalled in comparison with Figure 3 of the paper (e.g., lines 577-578: "Performance degradation becomes evident for all models under the 16× configuration." But the reader cannot directly spot this degradation). Why not include 3 columns for 16x and three columns for 8x to aid this qualitative comparison?
- 5) Paragraphs 5.1 and 5.2.1: after reading both paragraphs, I am doubtful that the visual comparison deserves such a large part of the manuscript. Could the Authors consider including quantitative comparison instead of qualitative one?
- 6) Figure 4: the colors of the series are hardly distinguishable. Quantitative parameters are very small, too. Isn't it possible to include a table with relevant parameters instead of the figure?
- 7) Line 631: U-NET or U-Net? Please check the text carefully.
- 8) Apparently, Figure 6 and 7 are not cited in the text
- 9) Check images: font dimension should be similar to the caption font dimension; panels should be lettered, and caption should be accordingly; check colors to ease symbols visibility.