Atmospheric
Measurement
Techniques

EGU

Discussions

Interactive comment on "The new Passive microwave Neural network Precipitation Retrieval (PNPR) algorithm for the cross-track scanning ATMS radiometer: description and verification study over Europe and Africa using GPM and TRMM spaceborne radars" *by Paolo Sanò et al.*

Anonymous Referee #2

Received and published: 29 July 2016

This study introduced a new version of the Passive microwave Neural network Precipitation Retrieval (PNPR v2), an algorithm for estimating instantaneous surface precipitation The main improvement of PNPR v2 in comparison with PNPR v1 contains several parts. Firstly, new data source from ATMS radiometer, which is more advanced in resolution and channel numbers than its predecessors AMSU and MHS, was used. Secondly, some new input variations were considered, especially the difference between the TBs of new channels (183.31$\pm$4.5GHz and 183.31$\pm$1.8GHz). Thirdly, PNPR v2 de-

signed one unique NN that is capable of operating on the whole area regardless of the type of surface and geographical area. The new PNPR v2 performs well benchmarked by TRMM-PR and GPM-KuPR. The paper also introduced potential contribution to the GPM mission which is attractive and inspiring. In general, the expression of this paper is good. The author reached all parts of a good paper required. Some revision is required before the paper is accepted.

Major Comments: 1. As the main body of PNPR v2 is very similar with PNPR v1, which is carefully described in another paper of the author in 2015, the author gave little technical description of the algorithm. But for completeness, the major technical parts of the algorithm should still be introduced with formula or figures briefly (e.g. the set of NN, the method to update weights and so on). It will facilitate readers to avoid additional literature search.

2. In page 6 and line 48, the author said the phase of the precipitation (solid, liquid, mixed or unknown) is contained in output. Is there any result and analysis of that? DPR can also differentiate solid and liquid phase.

3. In page 8 and line 6, the author used more than one hundred NNs to select the optimal network. What's the principle in adjusting the networks to get closer to the better one? And how can you tell the present one is the most optimized with some criteria?

Minor Comments: 1. In page 10 and line 37, "15 minute" should better be "15-minute".

2. In page 11 and line 36, there should be a comma at the end of "and over vegetated land (for all precipitation rates)". There are some other places where a comma is missing, the author should check by yourself again. 3. It would be better if Figure 1 is going to be turned into color one.

4. The numbers on the diagonal of Arid land in Table 2 were not bold.

5. In page 7 and line 20, how to define one "entry" and one "view"? What are two million

entries and 45 views consist of? The training database covers different seasons and different meteorological situations and precipitation regimes, is the number of each season, situation and regime equal to others?

6. In page 10 and line 37, what does "within a 15 minute time window" means?

7. In Page 11 and line 50, how to determine the intervals (0.01 - 0.25 mm/h, 0.25 - 1 mm/h, 1 - 5 mm/h and 5 - 15 mm/h)?

8. In Figure 3 (left one) and Figure 4, why the pixels presented in Figure 4 isn't consistent with the distribution of number of coincident pixels in Figure 3?