

Interactive comment on “Combined neural network/Phillips-Tikhonov approach to aerosol retrievals over land from the NASA Research Scanning Polarimeter” by Antonio Di Noia et al.

Anonymous Referee #2

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The manuscript should be very interesting for broad scientific community working with satellite data retrieval. The application of neural networks as an approach for aerosol/surface retrieval looks very promising. The results presented in the manuscript are convincing and well-described. The manuscript is completely suitable for publication in AMT.

Application of the neural network approach to airborne RSP measurements shows performance comparable with Phillips-Tikhonov approach with neural network first guess. This result seems a little bit confusing and requires more discussions in the manuscript, taking into account big potential of Phillips-Tikhonov approach with neural network first

C1

guess. It would be useful if authors could provide also some results of the synthetic test data retrieval both with Phillips-Tikhonov approach and the neural network approach. In this case it would be possible to compare two approaches on the same controlled synthetic data set.

Technical remarks: 1. Figures 10-13 do not contain any statistical characteristics like RMSE, BIAS, Correlation coefficient, number of used data. Adding these characteristics similarly to Figures 3-7 will make the presented results more clear. 2. On page 18 it is written: “We empirically found that a retrieval can be said to have converged successfully if it achieves a goodness-of-fit parameter smaller than 2.” Looking at Table 4 and Figure 9, one can conclude that the percentage of the “converged retrieval pixels” is very small. To better understand the convergence of the approach, the percentage of “converged retrieval pixels” would be very useful as additional parameter, for example, in Table 4.

Overall, I recommend this paper for publication in AMT after discussion and review corrections.

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C2