

Interactive comment on “A simple method for retrieval of dust aerosol optical depth with polarized reflectance over oceans” by Wenbo Sun et al.

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>The paper “A simple method for retrieval of dust aerosol optical depth with polarized reflectance over oceans” is aimed at the development of the technique to retrieve dust aerosol optical depth using spaceborne observations. Unfortunately I can not recommend this paper for publication. Actually the authors do not describe their technique to solve the inverse problem in the paper. They also do not show the validation results. They state that there is no robust method for remote sensing of aerosols based on polarized radiation measurements. This is not true (please, see the papers by Dubovik, Hasekamp, Herman, etc.).

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The authors thank this reviewer for the helpful comments and followed the reviewer's comments to correct the manuscript rigorously.

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Our Fig. 1 has clearly showed that dust aerosol OD can be simply retrieved using the DOP in the neighborhood of back-scatter angle. PARASOL data in the same figure validated the results. However, for a detailed algorithm, we are planning a full article after our instrument's data are obtained. This letter has no intention to report full algorithm, but a simple idea.

>They state that there is no robust method for remote sensing of aerosols based on polarized radiation measurements. This is not true (please, see the papers by Dubovik, Hasekamp, Herman, etc.).

We changed our statement to "However, the retrieval method of remote sensing of aerosols based on polarized radiation measurement is still in progress (Dubovik et al. 2019)." And cited

Dubovik, O., Li, Z., Mishchenko, M. I., Tanré, D., Karol, Y., Bojkov, B., Cairns, B., Diner, D. J., Espinosa, W. R., Goloub, P., Gu, X., Hasekamp, O., Hong, J., Hou, W., Knobelspiesse, K. D., Landgraf, J., Li, L., Litvinov, P., Liu, Y., Lopatin, A., Marbach, T., Maring, H., Martins, V., Meijer, Y., Milinevsky, G., Mukai, S., Parol, F., Qiao, Y., Remer, L., Rietjens, J., Sano, I., Stammes, P., Stamnes, S., Sun, X., Tabary, P., Travis, L. D., Waquet, F., Xu, F., Yan, C., and Yin, D.: Polarimetric remote sensing of atmospheric aerosols: instruments, methodologies, results, and perspectives, *J. Quant. Spectrosc. Radiat. Transfer* 224, 474-511, doi:10.1016/j.jqsrt.2018.11.024, 2019.

This review article reports the current status of polarization retrieval algorithms.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2019-713, 2019.

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