

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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Received and published: 14 November 2019

>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 a 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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Discussion paper



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 a 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.