

## ***Interactive comment on “Remote sensing of aerosols by using polarized, directional and spectral measurements within the A-Train: the PARASOL mission” by D. Tanré et al.***

**Anonymous Referee #2**

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General comments:

This paper provides a complete overview of the PARASOL mission with respect to aerosol retrieval. General observation conditions, the POLDER instrument, data processing and retrieval algorithms are summarized as well as results and upcoming developments. It is an important paper addressed to a broader community in atmospheric sciences. However, the paper needs significant improvements in language. Repeated information (ie. on the A-train), common knowledge and some details on other sensors (ie. Sect. 2.2) and algorithms should be removed to achieve more conciseness.

Specific comments:

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P2038 line 6+7: suggestion: 'nearUV' instead of 'UV' and give the wavelength range in the parenthesis.

P2038 line 10: suggestion: 'spectral' instead of 'wavelength'.

P2038 line 13: suggestion: 'optical and microphysical' instead of 'radiative and physical'.

P2040 line 15: remove 'let us remind that'.

P2043 line 19, Eq(1): mention and explain the weighting factor 'eta'.

P2044 line 3: remove 'Let us add that'.

P2044 line 19: suggestion: explain IGBP or added it to the list of abbreviations.

P2045 line 15: suggestion: 'accuracy is generally' instead of 'performances are'.

P2045 line 27: use 'AOD' instead of 'AOT' to remain consistent with the rest of the paper.

P2046 lines 7-10: please reformulate to avoid the question and to simplify the fragmented sentence.

P2046 line 28 and P2047 lines 1-2: this sensitivity has a minimum at the critical surface albedo and increases for very bright surfaces again [Fraser and Kaufman(1985)]. Fraser, R. and Kaufman, Y.: The Relative Importance of Aerosol Scattering and Absorption in Remote Sensing, IEEE Transactions on Geoscience and Remote Sensing, GE-23, 625-633, doi:10.1109/TGRS.1985.289380, 1985.

P2047 line 17: this section provides results and not only illustrations. 'Aerosol retrieval results' could be more precise.

P2048 lines 20-21: please reformulate to simplify the fragmented sentence. does 'above' and 'below' mean northwards and southwards?

P2052 line 11: the study by Kokhanovsky et al. (2010) provided synthetic data, not real

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PARASOL data as the current formulation pretends.

P2052 line 13: suggestion: 'accurate' instead of 'efficient' because calculation time was not part of this study.

P2052 line 14: the synthetic data in this study assumed a totally black surface (not ocean). this study compares retrieval accuracies of 'algorithms' not 'sensors'.

P2053 line 2: quantitative information on the computational speed would be helpful.

P2053 lines 5-11: please reformulate to shorten this paragraph, especially the second sentence.

P2054 lines 7-9: this could be explained in more details while the preceding text in Sect. 5.3 could be more concise.

P2054 lines 18-21: please reformulate to simplify the fragmented sentence.

P2054 line 23: please state what geometry is 'suitable'.

P2053 Table 1: please explain or remove TBD and TBC.

P2069 Fig.4: suggestion: plot AOD differences to provide a quantitative retrieval accuracy.

Technical corrections:

P2051 lines 25: typo: 'blue' instead of 'bue'.

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Interactive comment on Atmos. Meas. Tech. Discuss., 4, 2037, 2011.