

Interactive comment on “Statistically optimized inversion algorithm for enhanced retrieval of aerosol properties from spectral multi-angle polarimetric satellite observations” by O. Dubovik et al.

O. Dubovik et al.

dubovik@loa.univ-lille1.fr

Received and published: 3 April 2011

We thank Dr. Davis for pointing at an important aspect. It is correct that concept of multi-pixel when a group of pixels is inverted together is also convenient for rigorous accounting for cross-pixel coupling in this forward modeling of reflected radiances. This would allow reduction of the retrieval errors due to known adjacency effect. In present study, we have not attempted to account for the adjacency effect, because it is negligible for the size of POLDER/PARASOL pixel ($\sim 5.3\text{km} \times 6.2\text{km}$). In addition using

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rigorous 3D calculations is not really feasible in the algorithm that implement on-line radiative transfer calculations, because it would make the algorithm more complex and, unacceptably computationally demanding. We have included the clarifications of this aspect in the revised paper (see beginning of Section 4.2).

Also, as suggested by Dr. Davis, we have analyzed if the used term “multi-pixel retrieval” contradicts to any well-established terminology. We have concluded the following. First, as explained above, multi-pixel retrieval is an inversion strategy that is very appropriate for accounting for adjacency effect. In this respect there is no contradiction. In addition, we conducted a search with a goal to identify the existing common usages of “multi-pixel” terminology. We could not find well-established utilizations of this term in the “radiative transfer” publications. The “radiative transfer” publications tend to use term “adjacency effect”. In a contrast, we have found that “multi-pixel” is the terminology frequently used in digital imaging, where “multi-pixel” term is used to indicate that a group of pixels (a pixel - a single point in a raster image) were processed, handled, etc., together. Such utilization of “multi-pixel” is very close to our utilization of this term. Therefore, we believe that the term “multi-pixel” was used appropriately in our paper, and this term adequately corresponds to the essence of our approach.

Interactive comment on Atmos. Meas. Tech. Discuss., 3, 4967, 2010.

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