

Interactive comment on “SAWA experiment – properties of mineral dust aerosol as seen by synergic lidar and sun-photometer measurements” by A. E. Kardas et al.

A. E. Kardas et al.

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We are working intensively in order to rewrite the paper substantially, accounting for the referee comments. In the discussion part we addressed most of the specific comments, in the following we wish to address general remarks and specify the main changes included in the revised version of the manuscript.

In response to the Anonymous Referee 1.

After the review, we agree that our contribution has drawbacks, pointed by the Referee. There are three remarks we wish to make to general comments of the Referee 1.

1. The method of data processing, while is based on the described in the literature

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synergic measurements contains a new element: division of the atmosphere in three layers of different optical properties, this division is based on the lidar return signal and is described in the text.

2. We agree, that the paper is lacking the error analysis. We undertook efforts to give a comprehensive discussion of possible sources of error and their effect on the results. There is a couple of new sections in the revised version of the paper addressing this point:

a) there is detailed description of the overlap correction in the Teramobile lidar system as well as information on calibration procedure of the lidar;

b) We added discussion of possible errors due to assumed values of refractive index. This discussion is based on results of calculations with T-Matrix method for a range of refractive indices (Re from 1.5 to 1.6, Im from 0.08 to 0.0008).

c) We accounted for depolarisation by Rayleigh scattering of the atmospheric gases in new calculations, we are working on the appropriate section in the revised version of the paper.

3. In the revised version we accounted for the suggested references and are working on the more detailed and wide discussion of the results.

Answers to the Anonymous Referee 2.

We agree with both referees that the first version of our paper had substantial drawbacks, we addressed them in the answer to Referee 1 and in the discussion. We are doing our best to improve the revised version of the text. We do not agree, however, that the paper is out of the scope of ACP which are "... atmospheric modelling, field measurements, remote sensing.....". In the revised version comparison of the sun-photometric measurements with AERONET station in Belsk is added as well as more robust source analysis with use of HYSPLIT model results. During the experiment we studied the satellite imagery in order to follow the dust plume motion, the appropriate

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sentence can be added to the revised version of the paper.

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