

Interactive comment on “Seasonal distribution of aerosol properties over Europe and their impact on UV irradiance” by N. Y. Chubarova

Anonymous Referee #2

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The manuscript presents the novel UV aerosol dataset (2000–2008) over Europe based on the MODIS aerosol data. The description of the method used in the dataset construction is complete. The dataset is verified with ground AERONET measurements. The spatial and temporal distribution of monthly mean aerosol parameters is analyzed and used in calculations of aerosol impact on surface UV irradiance made with verified radiative transfer algorithm. It is shown that the estimated aerosol effect on UV loss is comparable with the total ozone influence. This important conclusion demonstrates the need for further study of aerosol properties. The presentation of the results is clear and well structured. It is written in fluent language.

The manuscript can be accepted with minor revisions:

1. Abstract To indicate that the aerosol optical thicknesses are monthly mean, the time
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period considered is from 2000 to 2008, and the aerosol impact on UV irradiance is comparable with the total ozone influence.

p. 1865 Parag. 20: Describe how overcast cloudiness, which is usual over Europe, can affect the MODIS aerosol dataset in various regions and seasons.

P. 1868 Parag. 15 How the spatial distribution of Angstrom parameter was obtained over the ocean if there are few AERONET stations in the ocean.

In Part 3.2, the author should indicate that the presented analysis of the aerosol sources and transport affecting the aerosol temporal and spatial distribution over Europe is partly speculative and only in part is proven by the presented climatology of wind and precipitation and by the results of a numerical transport model. Further ground-based aerosol observations and model simulations are needed in order to clarify this issue.

In Part 3.3, significant sensitivity of UV loss to aerosol single scattering albedo (SSA) is shown (Fig. 9). Hence, how to justify the use of mean SSA in the construction of UV loss climatology? May be to use the available range of SSA (0.77–0.99) for UV loss calculations?

Formula (3): Does the aerosol asymmetry factor influence UV loss?

To check the references: There is no ((McKenzie, et al., 2002) in the Reference List.

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