

Interactive comment on “On the radiative impact of aerosols on photolysis rates: comparison of simulations and observations in the Lampedusa island during the ChArMEx/ADRIMED campaign” by S. Mailler et al.

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I find this work very interesting. Here are some minor comments:

1. The backplume calculation methodology seems to be original: it is then expected to discuss in the methodological section its relevance and possible advantages and limitations compared to other classical trajectory tools very frequently used in the literature (namely HYSPLIT and FLEXPART).

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2. According to me, the selection made of only the two AERONET stations of Oujda and Palma de Mallorca, in addition to Lampedusa station, is not fully justified: there are many more AERONET stations with available data in the considered region and period (e.g. Gozo, Potenza, Tamanrasset, Tizi-Ouzou and a few others in Spain) including the two stations of Cagliari (Sardinia Isl.) and Cap d'en Font (Minorca Isl.) especially set-up as part of the ChArMEx/ADRIMED campaign effort.

3. I would expect that you check with AERONET values retrieved in case of high dust episodes (i) the range of variability in the dust particle refractive index found at Lampedusa and (ii) how the values used by the model are appropriate. I find that we miss a sensitivity study to the dust refractive index.

4. I would like to stress that the new daily daytime average AOD(630nm) product from MSG/SEVIRI (Carrer, D., et al.: AERUS-GEO: A newly available satellite-derived aerosol optical depth product over Europe and Africa, *Geophys. Res. Lett.*, 41, doi:10.1002/2014GL061707, 2014) originally produced for the SOP1a of ChArMEx offers a better spatial coverage than MODIS (take care to use only pixels with the parameter age=0, since others are taken from previous days). The daily product of AOD(550nm) over ocean surfaces from MSG/SEVIRI (Thieuleux et al.: Remote sensing of aerosols over the oceans using MSG/SEVIRI imagery, *Annal. Geophys.* 23, 1-8, 2005) also offers a better coverage than MODIS, although limited to ocean surfaces, and possibly biased high by -35% (Chazette et al., in prep. for ACPD). Both products are available from the ICARE web site (<http://www.icare.univ-lille1.fr>). Limited areas in the North Sea and English Channel are visible on 21 June which do not really support the very high AOD values from CHIMERE in this area.

5. About figure 3: you might provide a figure showing the number of MODIS data in the period in order to document their reliability/significance; additional maps comparing standard deviations from CHIMERE and MODIS would be useful information.

6. A plot of NO_x emissions might be useful to complement Fig. 15c and its discussion.

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