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Interactive comment on "Aerosol optical properties at Lampedusa (Central Mediterranean) – 1.Influence of transport and identification of different aerosol types" *by* G. Pace et al.

Anonymous Referee #1

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The paper presents the analysis of two years of semi-continuous measurements of spectral aerosol optical depth and Angstrom exponent performed at the island of Lampedusa, in the central Mediterranean, by the mean of a MFRSR. The dataset is used to identify the major aerosol types occurring in the area. By coupling the data to calculated back trajectories, the authors estimate the most frequent airmass transport patterns, and associated aerosol load and type. Finally, the authors examine a three-week period in summer 2003 when extreme weather conditions led to extensive biomass burning in Southern Europe. The paper is scientifically sounded, and whereas not very original, it nicely complements some previous similar data acquisi-

tion and analysis performed in the Eastern Mediterranean. Furthermore, the body of observation in the Central Mediterranean still being limited, this paper is an important contribution to our knowledge of the aerosol load and types in this geographical region.

Some specific comments:

Page 4933, lines 22-23. What is the influence of the changed averaging interval in the data analysis? I suppose that cloud contamination is more problematic for a long averaging time, therefore those data should have larger uncertainties.

Page 4939, lines 25 onwards. "For this reason, we developed a different method to identify the aerosol source sector. We assume that the aerosol is confined to the boundary layer at the source location, and we look for regions along the trajectory where the airmass interacts with the boundary layer. We assume that aerosol is loaded when the airmass altitude, zair, is lower or close to the altitude of the mixed layer, zmxl (entrainment condition); we apply the condition (zair-zmxl)$<$500 m. The geographical sector where this condition is met along the trajectory is identified as the source of the observed aerosol. The region around Lampedusa (latitude and longitude around the island) is excluded from the search. If the entrainment condition is met at more than one point, we choose the geographical position where the difference (zair-zmxl) is lower (sign included). Both the airmass and mixed layer altitudes are supplied by the Hysplit dispersion model" It could happen that the (zair-zmxl) is lower at sector A than at sector B, but for a shorter lapse of time. In this case, at which sector would the airmass be assigned?

Other comments: 1) If possible, I would suggest expanding the comparison to aerosol optical depth data collected in the western Mediterranean 2) Finally, I would suggest that section 4 is renamed into "Column load and aerosol types" instead that "Optical properties and aerosol types"

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 4929, 2005.