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Interactive comment on “Characterization of PM₁₀ sources in the central Mediterranean” by G. Calzolari et al.

Anonymous Referee #1

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The manuscript presents interesting results on PM₁₀ chemical characterization in a Central Mediterranean coastal site. These data are useful for improving the understanding of aerosols variability and processes in the Med Basin, and validate modelling outputs in a region with a general lack of data. The work has been carried out correctly, well presented, and data interpretation is in my opinion reasonable within the uncertainty of the methods used. The main uncertainty is given by the lack of EC and mostly OC data for the source apportionment. Authors claim on the low mass contribution of EC, but in my opinion its signal is still key in tracing primary combustion emissions. OC would also help improving significantly the share of secondary vs primary PM, mostly for the two combustion sources found. In any case authors have presented the (partial) ECOC data available and compared them with PMF source contributions, which show

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reasonable results. Still mineral dust and sea salt contributions are much higher than speciation data (why carbonates are not included?), which authors should also ascribe (even if partially) to the 40% of undetermined mass. The identified factors are indeed realistic but the source contributions could be affected by large errors due to this fact. I strongly advice to carry out Bootstrapping, Displacement and BS-DISP analysis (EPA PMF5) to explore what are the errors in source contributions. Before doing that I suggest also to explore the solution with the additional Ca-Sr factor. Soil of Lampedusa is rich in Calcite and Dolomite, and we are probably facing a local resuspension source. Would be interesting to look at the daily contributions of this source (also vs the other crustal source).

Other minor corrections suggested:

-revise some typos (e.g. Mallorcal) - some more details of sampling site in section 2.1 would be welcome, although they are discussed throughout the article. -please provide brand of teflon filters - the comparison of observed values with urban sites from literature might be misleading. - Why there are missing data only for Cu?? - check the Mg oxidation number in page 20028 - Saharan dust plume may carry also emissions from Refineries - I could not visualize Figure 4 - The citation Kim et al., 2008 in page 20034 is incorrect. It should be Kim and Hopke, 2008

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