

## ***Interactive comment on “Advanced characterization of aerosol properties from measurements of spectral optical depth using the GRASP algorithm” by B. Torres et al.***

**B. Torres et al.**

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Interactive comment on “Advanced characterization of aerosol properties from measurements of spectral optical depth using the GRASP algorithm” by B. Torres et al. F. Dulac (Editor) francois.dulac@cea.fr Received and published: 18 January 2017 Thank you for your submission to the ChArMEx Special Issue of AMT. I am, however, somewhat frustrated that application to ChArMEx data is only one small sub-section at the end of your manuscript. It is indeed of special interest because it refers to original airborne photometric data with the recent PLASMA instrument. But in order to better relate the study to other available ChArMEx data and justify publication as part of the

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ChArMEx Special issue, I recommend a more complete link to ChArMEx. On one side, you miss referring to ChArMEx papers that discuss the size distribution and/or absorption properties of Mediterranean aerosols (e.g. Mallet et al., 2013, doi:10.5194/acp-13-9195-2013; Denjean et al., 2016, doi:10.5194/acp-16-1081-2016; see also Fig. 14 in Renard et al., 2016, doi:10.5194/amt-9-1721-2016). On the other side, you might consider a couple of Mediterranean AERONET sites with large data sets in your sensitivity tests. Following Mallet et al. (2013), I could suggest Rome (urban aerosols with relatively low omega-0) and Sede Boker (dusty site with the longest time series in the Med. region). It seems to me that comparisons might also be worth being tested with AERONET inversions at ChArMEx super sites of Ersa and Lampedusa. Other case studies, such as those of July 2012 documented by lidar by Granadoz-Muñoz et al. (2016; doi: 10.5194/acp-16-7043-2016) might also be considered.

The climatology by Dubovik et al. (2002a) provides dynamical models where the parameters defining the aerosol properties (size distribution approximated by a bimodal log-normal function, and complex refractive indices) can be calculated from the values of the aerosol optical thickness. This is not the case in the study Mallet et al. 2013, where the authors give climatological values of the mediterranean sites but they do not define such dynamical models. Therefore, and as discussed in private, to include them in the sensitivity analysis was not possible.

Nevertheless, we were aware that we have submitted the paper in the special issue of ChArMEx. Therefore, the sites of Rome and Lampedusa were included in the analysis in the section 4.1.2

Other technical comments: p.19, line 15: please specify  $> 40^\circ$ .

Corrected, thank you.

In the bibliography, please replace "n/a-n/a" by the paper number given before the year of publication in several JGR papers (Kaskaoutis et al., 2009; Kim et al., 2004; O'Neil et al., 2003; Schmid et al., 2003; Schuster et al., 2006; Smirnov et al., 2009).

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Corrected, thank you.

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Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-334, 2016.

**AMTD**

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