Atmospheric
Measurement
Techniques
Discussions

Interactive comment on "Aerosol optical characteristics in the urban area of Rome, Italy, and their impact on the UV index" *by* Monica Campanelli et al.

Anonymous Referee #2

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A) General comments The manuscript is a description of the analysis of atmospheric Aerosols and solar UV measurement in Rome, Italy. The targets are scientists interested in the both, the relation between aerosols and UV radiation and the measurement of the aerosols in the city of Rome itself. Next to the detailed explanation of the measurements, the data of the years 2010-2016 have been analyzed. Altogether this results in a high-quality analysis and a nice study of the relationship of aerosols and UV radiation in a city with significant pollution (aerosols) and high level of UV (Italy). The work is well presented and in good quality both in writing and presenting. However, the author tends to very long sentences which makes the reading and understanding more difficult.

B) Specific scientific comments All technical parts of the measurements and analysis are well described. The following additionally point should be discussed to enhance the quality of the manuscript: 1. Line 55: In the Introduction it was explicitly mentioned that "especially in Winter" a good relation between aerosols and UV was found. However, in this study only Spring and Summer month were used. The author should at least discuss why their data with SZA>40 is not usable. 2. Line 97: The Uncertainty of the total ozone measurements is given with 1%. However, no estimate is given for the actual UV measurements. Especially a discussion of the uncertainty of the extrapolation in the UVA range (325nm-400nm) is missing (measurement only up to 325nm!). 3. Line 101: "In addition several tests are performed". Well, the IOS intercomparison is mainly used for the Brewer Ozone measurements. The traceability of the UV measurements is either calibrated using irradiance standards or obtained through intercomparisons to reference spectroradiometers. If any of those action are available for Brewer #067 it should be mentioned and referenced in the paper. 4. Line 218: "AERONET inversion" should be explained. 5. Line 241: "In these days a substantial decrease..." –Figure 3 shows sometimes a small decrease but also an increase of sea and soil (1 to 2 July). In the third event the soil components increased from 12 to 25 %! 6. Figure 1: Errors bars indicate only the measurements uncertainty (?) but not the total expanded uncertainty of the measurements. See also comment 2. 7. Normalization of UVI: RAF is according to the referenced paper (Di Sarra 2002) of high uncertainty (between 0.8 and 1.44. Taking 1.25 should be justified in more detail and added to the (missing) uncertainty budget.

C.) Presentation The manuscript is clearly structured. Minor modifications are recommended to improve the quality of the paper: Line 166: Subscript 0 of Theta_0 is irritating. Line 194: "PM" -> probably "PM10" is correct at this position. Line 226 – 228: Good example of a very confusing long sentence. Figure 5: The two different bar-plots for SZA=30 deg and SZA=40 deg cannot be distinguished. Line 409: "direct solar radiation" or "direct and diffuse solar radiation"? Figure 1 is overloaded. "n points" should be part of the uncertainty budget, "precipitation and pressure" is not used and these

graphs don't add relevant information. Units in the figure axis labels should be labeled as "/unit" to have a dimensionless number and not "(unit)". Figure is using a different labelling (% CONTRIBUTION").

Typos: line 336: "whit" -> "with" line 348: (Table II): Theta=40 deg -> 40 in bold

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