

# ***Interactive comment on “Aerosol type classification analysis using EARLINET multiwavelength and depolarization lidar observations” by Maria Mylonaki et al.***

## **Anonymous Referee #2**

Received and published: 25 November 2020

This paper reported a new algorithm to classify the aerosols layers type in a measurement site. The authors shows a comparison between two previous reported algorithms (“Neural Network Aerosol Typing Algorithm”, and “Mahalanobis distance automatic aerosol type classification” and the new one (“Source Classification Analysis”) using 97 free tropospheric aerosol layers from 4 EARLINET stations. Although there are some aerosol classification algorithms, this new method has the advantage that it does not need the properties of the aerosols to get the aerosol type. This report brings an important contribution to the scientific community and I believe it can be published in ACP. I have some technical comments that should be checked before publication.

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Technical Corrections Recommended to acp-2020-865-manuscript-version1.pdf.

Ln 28: "...while MD has the percentage of unclassified..." Suggestion: "...while MD has the higher percentage of unclassified..."

Ln 38: "(Weitcamp et al., 2005)." Note: I did not find it at the references list

Ln 43 - 45: Suggestion: Please check this sentence.

Ln 111: "whieâŽž" Suggestion: While,

Ln 116: Kavoudou et al. (2019) Note: I did not find it at the references list

Ln 168: In total, 97 FT aerosol Suggestion: This was first mentioned in the abstract, I recommend you to introduce here in the text for the first time

Ln 173 - 174: the units in the Y axis for altitude in the graphics are reported in meters, and it should be in km, as is stated in the text.

Ln 186: "Ab355/532=1.36 $\pm$ 0.05" Suggestion: 0.05 ???

Ln 237 - 238: Same as previous comment (Ln 173 - 174) about units of altitude in meter or kilometer?

Ln 239: (i) Kuopio and (ii) Potenza at 3000 m amsl. Note: The are not the notation i and ii in the graphics

Ln 353: "Table 2." Suggestion: Table 3 ?????

Ln 369: "Ir 523" Suggestion: 532?

Ln 378: Catral et al. (2005); Note: is it on the reference list?

Ln 379: Gross et al. (2016), Note: is it on the reference list?

Ln 384: Papagiannopoulos et al. (2016a) Note: There is only one Papagiannopoulos 2016, why a?

Ln 391: Continental Polluted and Marine aerosols (cp&m) Note: What about aerosol properties values derived from NATALI?

Ln 457: References Note: There are some papers are not referenced in the text. Please check it. eg: Amiridis et al. 2009 is not referenced in the text Ansmann et al. 2003 is not referenced in the text

Ln 786: Table 3: Mean values and standard deviations of aerosol optical properties according to classification each classification method. Note: This table is not discussed in the text.

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