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Atmospheric Chemistry and Physics Discussions

Interactive comment on "A climatological study of rural surface ozone in central Greece" *by* P. D. Kalabokas and C. C. Repapis

Anonymous Referee #1

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General Comments

This paper deals with a particularly important topic for the region. I am not certain, however, to what extent inferences about rural ozone can be made from urban stations (whatever the authors call them, they are stations located in the Athens' conurbation) based on ozone data alone. As indicated in text NO_2 levels are 3–5 times higher at the Athens' stations compared to the rural station at Aliartos. Therefore the ozone chemistry would be expected to vary between the two urban and the rural stations. **Perhaps** examination of CO data would indeed show the Athens' stations to behave as rural.

Comparison of the Athens' stations data, screened for wind speed and direction, with data from the rural Aliartos station, **but** for all wind speeds and directions, may be

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misleading. It is more appropriate to compare similar air masses situations, that is only similarly screened data for all three stations. This difficulty is further emphasized by the comparison of different time periods between the compared data, even though one may argue that sufficiently long periods are compared. Selecting wind speeds greater than 5 m/s does not mean particularly "Strong" winds.

I suggest the paper be rewritten given the above reservations and the detail comments that follow.

Detailed Comments

Page 4992, line 8: Is the use for the term "background" for the Geoponiki station meaningful? In fig 1 this station is shown to be in the heart of the Athens basin, and its annual NO_2 mean values are particularly high.

Page 4993, line 7: "Geoponiki station is not influenced from direct NO_x emissions...". Yet, Fig. 6 shows NO_2 values 5-6 times higher than those given at Aliartos, Fig. 2. Only examination of NO daily variation could show to what extent this station is influenced by direct emissions.

Page 4993, line 25: I do not think the ozone profile of Fig 3 for Aliartos would be the shown one if the screened for wind data, as done at the Athens' stations, were plotted. The same applies to other comparisons, between the Athens' and the Aliartos' values of Figs. 4,5,6,7,8 and 11. See also General Comments.

Page 4994, line 9: One cannot speak of "spatial homogeneity" given the comparison of different data sets.

Page 4995, line 3: I suggest the sentence "The quantity O_x ...1994" be removed as it is not very relevant.

Page 4995, paragraph starting at line 7: The Aliartos values under north strong winds should be selected for the comparison.

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Page 4997, line 18: I do not agree that the height above sea level of the Liossia station is the main reason. I think it is the wind screening. The authors could derive-prove the main reason by comparing the nocturnal ozone values under different wind conditions.

Page 4997, line 27: Fig. 6 does not show nocturnal NO_2 balues.

Page 5000, paragraph starting at line 19: I fail to see the relation between values at high altitude sites and the Athens' values. No evidence for tendency was presented in this work.

Page 5002, paragraph starting at line 11: This conclusion should be supported by relevant References.

Page 5002, paragraph starting at line 15: Should be added that the Athens' data were screened for wind conditions.

Page 5002, paragraph starting at line 23: 8-hr averages were not derived in this work.

Page 5003, paragraph starting at line 1: Very little results and discussion relevant to this topic were presented in this work, to be included as conclusion.

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 4989, 2003.