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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Vertical ozone measurements in the troposphere over the Eastern Mediterranean and comparison with Central Europe" *by* P. D. Kalabokas et al.

Anonymous Referee #3

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General comments

The paper is scientifically sound, but it leaves me ambiguous as I do not see a clear scientific focus. To me the paper appears more like an analysis of data that happen to be available. I am missing a better justification for the work and how it relates to other work. The methods are not guided by a clear aim. Together with the sparseness of the data analysed, the paper appears somewhat inconsequential.

Specific comments

Abstract, line 7: "significantly enhanced" compared to what?

Introduction: The authors summarize (or better: list) the work done in the past. What were the findings of these papers, and what are the remaining open questions? How do the authors address these questions? I also miss a discussion of their findings in the light of previous results. It is somehow odd that there is no single reference to studies on ozone in the Mediterranean in the results, discussion, and conclusions part of the paper.

Introduction: The authors mention two papers that lament the lack of long term monitoring of surface ozone in the Mediterranean region. However, the papers are from 1993 and 1997. Given the large interest in photochemistry and pollution transport in Mediterranean area in field campaigns since that time, the reader wonders whether (and if so, why) there is still no long term monitoring. Also, I don't really see the point the authors want to make. Is the MOZAIC data set in this paper used as a substitute for long term monitoring?

I don't see a clear focus in the introduction. The aim of the work, according to the authors "is to investigate the high ozone background in the boundary layer over Greece and the Aegean Sea". However, the authors do not define what they mean with "background", they do not say which processes, according to the literature, background ozone is related to, and how these processes can be addressed and separated from other processes in a data analysis. Does their method, i.e., to select high and low ozone days, tell us something about background ozone? If so, which group is "background"; the high or the low ozone days?

Methods: What is the motivation of comparing central Europe and the Mediterranean (apart from the fact that flights connect the two areas? A lot is known already about ozone in central Europe.

The CO data seem to be misplaced. What can we learn from two profiles?

Results, Section 2.4: "This downward flow is expected to cause similar ozone increases in the lower tropospheric layers down to the surface." This depends on the vertical

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gradient and needs to be demonstrated.

Figures: It would be helpful to add measurement locations to Figures 2, 3, 5, and 6.

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