

Interactive comment on “Attributing and quantifying European carbon monoxide sources affecting the Eastern Mediterranean: a combined satellite, modelling, and synoptic analysis study” by R. Drori et al.

Anonymous Referee #1

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The title accurately describes the topic of the manuscript: “Attributing and quantifying European carbon monoxide sources affecting the Eastern Mediterranean: a combined satellite, modeling, and synoptic analysis study”

1) One of my major concerns is that this manuscript may not be of interest outside of Israel. One guideline of manuscripts submitted to ACP says: “The journal scope is focused on studies with general implications for atmospheric science rather than investigations that are primarily of local or technical interest.” Therefore, I advise the authors to discuss the importance of their work to the broader community.

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2) Another major concern is that the conclusions of this manuscript do not provide any new scientific insights. The authors would benefit from a detailed literature search on the long range transport of European pollution. For example:

“Several studies have presented strong evidence for contamination of lower troposphere layers over the EM by pollution emitted from European sources during the summer (Dayan and Graber, 1981; Dayan and Levy, 2005; Koch and Dayan, 1992; Dayan et al., 2002).” There are many other manuscripts to cite than those by Dayan et al. Consider citing papers from the MINOS campaign and papers looking at the long range transport of pollution (CO, ozone, PM) from Europe, e.g.:

“The influence of European pollution on ozone in the Near East and northern Africa”, Duncan et al., Atmos. Chem. Phys., 8, 2267–2283, 2008

Kallos et al., A.: On the long-range transport of air pollutants from Europe to Africa, Geophys. Res. Lett., 25(5), 619–622, 1998.

Kallos et al.: Long-range transport of anthropogenically and naturally produced particulate matter in the Mediterranean and North Atlantic: Current state of knowledge, J. Appl. Meteorol., 46(8), 1230–1251, 2007.

Therefore, I advise the authors to put their research into context with published literature on the long-range transport of pollution from Europe. What are the new conclusions from your research?

3) Why focus on CO when ozone and PM are more important pollutants for human health?

4) When evaluating the model's ability to reproduce observations of CO, please deseasonalize the data and model output before calculating the bias and correlation. When looking at CO data over a year, much of the correlation is simply related to the model capturing the seasonal cycle of CO. I suspect that your correlations will be lower and more telling, showing model weaknesses.

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