

Interactive comment on “Weekly cycles in precipitation in a polluted region of Europe” by C. W. Stjern

P. Barmet (Referee)

barmetp@ethz.ch

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General

This paper represents a substantial contribution to the controversial scientific discussion about weekly cycles in meteorological variables and I think that it is of interest to ACP. It brings up the conflicting results of studies on weekly cycles and by looking at a highly polluted region and time period, the paper focuses on a point where one is more likely to detect short-time interactions between meteorological variables and anthropogenic pollution. I agree with Mr Hendricks Franssen and Mr Kuster that the paper should be published after moderate modifications. All in all I really liked the paper very much.

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One general remark, which concerns the whole paper, is the use of the term “significant”. I agree that one can use it in this way, but one must be careful since the term “statistically significant” refers to the results of a Kruskal Wallis test. For the other two tests (especially for the 6-7-8day-week comparison) I would try to avoid this term, if possible. Also sections 4.2 and 4.3 are a bit hard to read, as some tests show a “significant” weekly cycle for some specific periods, while other tests do not (More about this under specific remarks).

Specific remarks I discussed this paper with Thomas Kuster and we both agreed on the general and specific comments that he made in his short comment a few days ago.

Title I agree with Mr Hendricks Franssen: I would change the title, since you looked at many more variables than only precipitation.

Several times the term “regional” is used (e.g. page 1784, line 26 or in the caption of Fig. 4). Does this always refer to the mean of all the stations in the Black Triangle?

Page 1784, Lines 6-9: I would reconsider citing Bäumer and Vogel or Sanchez-Lorenzo et al. here, since this result is thought to be a consequence of neglecting the spatial correlation between the different stations, resulting in a false statistical significance (Hendricks-Franssen et. al, 2009) .

Page 1784, Line 22: Here I would really discuss, as others commenters have mentioned, that this could also be coincidence. And I wonder why the Kruskal-Wallis test reveals a different result applied to the raw data or to the the anomalies. Do you have any explications for this? It might help to follow Mr Hendriks Franssens suggestion and perform a Monte Carlo simulation, or test also the 6 and 8-day-weeks with a Kruskal-Wallis test.

Page 1785, Line 1-3: One could understand this sentence also in such way that: “if aerosols do have an influence on precipitation, we expect a more pronounced weekly cycle.” I preferred the phrasing in the introduction.

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Page 1786, Line 12: which period? For the entire (1983–2008), the more polluted (1983–1987) period or the cleaner (2004–2008) period?

Page 1787, Line 1: Here I assume that with “non significant” you refer to the result of a Kruskal-Wallis test. In the previous sentence, you used the expression “significant” for the other tests as well.

Minor Comments

Page 1785, Line 17: There was only ONE statistical test performed. And you did not look at seasonal cycles, did you? Assuming that my understanding is correct, you could write something like this: “[...] none of the seasons showed a clear weekly cycle in any of the tests.”

Page 1789, Line 8: “[...] passed all three tests for significance [...]”. This might not be correct to say it in this way. Especially the 6-7-8-day-week comparison does not reveal a “passed significance” or not.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 1777, 2011.