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Atmospheric Chemistry and Physics Discussions

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

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General Comments

For the ongoing discussion about weekly cycles in meteorological variables this paper is of interest. The author focuses on a particularly dirty region where a clearer weekly cycle is to be expected. For a more accurate evaluation of a weekly cycle in pollution it would be desirable to investigate more than one pollutant. Nevertheless, we think the paper should be published after a few changes.

Specific Comments

Page 1778 Line 13 "the amplitude ... increased with longitude towards the more polluted eastern part". The climate is also changing with longitude towards east (more continental). Have you checked how the Fig 4 would look like during other time periods (for example shortly after 1900)?

Page 1781 Line 1 Are there any other stations, which measured pollution in this area? Which substances were measured by this stations? Did you check, if there is a weekly cycle for example in PM?

Page 1783 Line 5–12 How does a 6/7/8-day test for SO_2 look like? What is the result of the KW-Test applied on a 6 or 8-day week?

Page 1783 Line 12 You compare different substances and different time periods (Barmet et al.: 1998–2006, you 1990–2008).

Page 1784 Line 12 You compare results from different time periods. In our master thesis (Weekly Periodicities in Climatology, P. Barmet and Th. Kuster) we looked at the period 1992–2006 (Fig 4.11: Weekly cycle of daily precipitation (5:40 to 5:40 UTC) anomaly averaged over all stations. Period: 1992-01-01 to 2006-12-31.) which would match better: We got an amplitude of almost 0.4mm.

Page 1784 Line 22 If your level of significance is 5% ($\alpha = 0.05$), you should get 1.5 false positive (Type I error) stations ($30 \cdot \alpha = 1.5$). Your result is only slightly higher (3 stations), which might be just a coincidence. Have you checked the KW-Test itself? You could make for example 6 and 8 days week and check whether the KW-Test provides a useful result (no more than 5% significant results, if your level of significance is 5%)

Page 1785 Line 20 "contrary to their prospect": We have only said it could be, that one could find a weekly cycle in higher polluted regions, but we are not sure. However we want to thank you for your work.

Technical Corresctions

Page 1783 Line 19 "... in the Black Triangle ...". What is the definition of the Black Triangle? A region with the shape of a triangle or the region aroundthe boarder triangle (Czech Republic, Germany and Poland)?

Page 1778 Line 4 "... we ..." → "... I ..." (C. W. Stjern → just one author(?))

Page 1778 Line 20 "... only by one of the three tests ..." → add by which one.

Page 1782 Line 17 "We also show measurements of ... visibility" → We also show observations of ... visibility.

Page 1788 Line 7 BT → Black Triangle

Page 1789 line 3 "Barmet et al. ... weekly cycle in light precipitation", we didn't analyze light rain in our paper.

Page 1789 Line 9 "... 1/7 days ..." → "... 1/(7 days) ..." → "... $1/7\,\mathrm{d}^{-1}$ ..."

Page 1796 Fig 4 and Page 1798 Fig 6 The scale and range of the ordinate should be the same. This makes it easier to read.

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