

Interactive comment on “Influence of meteorology on PM₁₀ trends and variability in Switzerland from 1991 to 2008” by I. Barmpadimos et al.

Anonymous Referee #1

Received and published: 20 December 2010

This paper is a very interesting contribution for our understanding of meteorological influenced long-time trends of PM₁₀ in Europe. Switzerland is geographical but not political part of Europe therefore the authors discuss in the introduction the different regulations for PM₁₀ in Switzerland in comparison to Europe and give a hint to the new legislation for PM_{2.5} in Europe. Because a complex set of data (1991 – 2008) from 13 stations (kerb sites, urban and rural sites) in Switzerland with sufficient quality used the publication is important for atmospheric science. I recommend the publication of the manuscript in his present form with only some technical improvements.

In the long time dataset the earlier data are daily TSP measurements (1991 – 1997), since 1997 till 2000 daily PM₁₀ measurements are available and since 2001 to 2008 the frequency for PM₁₀ measurements is every fourth day. The missing days were

C11313

complemented than by beta attenuation monitors and latest by TEOM FDMS measurements. Also the filter material changed from glass the quartz fiber. The authors describe conclusive and in detail how the essential homogenization of the data was done and show in scatterplots for different stations in the supplemented material that an assessment of PM₁₀ from one year site by site measurements of TSP and PM₁₀ (1997) at different stations under the assumption that the ratios would be approximately constant through the 1991 – 1997 period and equal the year of site by site measurements (1997)

The using of a Generalized Additive Model (GAM) is described very systematically. The influence of most important variables on the airborne particle mass concentration would be discussed in detail. Therefore data from each season were treated separately. The “week end effect” was identified for the “day of the week” variable for some stations. An important result after meteorological adjustment is the finding that the weather during winter in the last 20 years of the 20th century has changed and now favors the accumulation of PM₁₀. However in almost all seasons and stations was found a downward trend in the adjusted PM₁₀ concentration

The manuscript is well written, understandable and very pleasant to read. The Title is comprehensive. The abstract is adequate and compact. All tables and picture are of good quality and referred in the text. Although I am not a native speaker it seems for me that the quality of English-writing is o.k. Therefore I have only some technical comments that should be considered in the revised version:

In contrast to the good quality of the manuscript some citations are missing in the references: These are in detail:

Page 26963, line 11: Swiss Federal Council, 1999

Page 26964, line 1: Easter and Peters (1993), line 27: Zolghadri and Cazaurang (2006)

Page 26965, line 2 and page 26976, line 4: Hooyberghs et al. 2005 Page 26968, line

C11314

14: Seibert et al. (2000)

At page 26978 the citation (Weber and Prévôt, 2002) is given two times in line 12 and 14. It seems to be correct to give the citation only in line 14.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 26961, 2010.

C11315