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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Planetary boundary influence at the Jungfraujoch analyzed by aerosol cycles and synoptic weather types" *by* M. Collaud Coen et al.

Anonymous Referee #1

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General comments

This manuscript describes relationship between synoptic meteorological pattern and concentrations of pollutants (aerosols, CO etc) at JFJ. This manuscript contains potentially useful data of seasonal frequency variations of weather types at JFJ, but the current manuscript is lacking new findings after previous publications such as Lugauer et al. (1998; 2000), Zellweger et al. (2003), and Henne et al. (2004; 2005).

This manuscript also fails to show clear aim for further analyzing these data at JFJ.

Methods of data analysis (last paragraph of section 2.2) and weather statistics were not clear to me.

Discussion on meteorological conditions of new particle formation (NPF) during convective lifting might be interesting to deduce favorable meteorological condition of NPF at this site, but the authors limited to show qualitative discussion and no further analysis was given.

Combined above, I recommend major revision of the current manuscript for publication in ACP.

[Title] I feel that the word “aerosol cycles” does not fit with the context of the manuscript.

[1 Introduction] The aim of this study is not clearly stated. This section needs the reason “to refine” previous reports.

Unnecessarily sentences must be removed, such as p987 L3-4 and p987 L27-p988 L3.

[2.2 & 2.3 data analysis] More description is required for data analysis (the last sentence of the last paragraph in section 2.2). How did you calculate contributions of weather types to the annual average?

To separate weather types, what kind of meteorological data (at what time? 00UT?) did you use? Were weather types clearly separated always?

[3.1 title] The title of section 3.1 needs to refine, because AWS is Alpine weather statistics.

[3.4] p999 L5 For what purpose?

[4] p999-p1000 This part needs revision. I cannot follow this discussion. Is this part just memorandum for the next sections?

[4.1] To show location of Payerne, adding a map is helpful to readers.

p1002 L15-16 In February – March, N for CC during am in Fig. 5 is not so low. More discussion (with data) of aerosol surface area may be needed but should be separated

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for N and surface area.

As mentioned in p1005 L15, precipitation would frequently be associated with the CC type. Cloud particles might scavenge precursor gases from the air. This leads less chance to nucleate new particles.

p1003 L3 “FT conditions prevail during the night”. This statement needs evidence and proper reasoning.

p1003 L10-12 This part sounds speculative.

[4.2] Again, to show locations of Payerne and Stabio, adding a map is helpful to readers.

p1004 L22 Henne et al., 2005?

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 985, 2011.