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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Statistical analysis of non-methane hydrocarbon variability at a European background location (Jungfraujoch, Switzerland)" *by* V. A. Lanz et al.

Anonymous Referee #2

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The authors evaluate an 8 year dataset of 10 volatile hydrocarbons and chlorinated compounds from the Jungfraujoch observatory in Switzerland. I do not have doubts about the quality of the data, which are from an experienced and committed research group and certainly are of high scientific value. However in my opinion, the presented evaluation is poor and premature and therefore I suggest the paper should be rejected in its current form. The authors use elaborate factor analysis to interpret the dataset with the goal to investigate factors driving the variability at the high alpine Jungfraujoch site. I do not think these goals were met. They developed 4 factors but their meaning and interpretation remains very ambiguous. For example, the most dominant factor 1 has a strong seasonality with high dominance in winter and lower dominance in

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summer. Because the hydrocarbons with longer lifetimes loaded high on factor 1 it was interpreted as aged combustion. However, this interpretation contradicts the seasonal cycle. Photooxidation is stronger during summer and therefore I would expect the air to be more aged during this season. After all, the factor analysis does not yield insights that I find worth publishing in ACP. There are certainly interesting aspects in the data that are touched, such as the correlation of factor 1 with methane or the analysis of potential source regions with back trajectories. But this analysis could have been done also by using concentration data of individual compounds. This would yield potential source regions of real compounds instead of factors the meaning of the latter being highly uncertain. I share the opinion of the other reviewer who reckons that more compounds need to be integrated in the factor analysis to make it meaningful. They also provide useful suggestions for improving the interpretation of the data. But the necessary changes are too extensive, require a different approach, and need to result in a new submission.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 19527, 2008.

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Interactive Comment