

Interactive comment on “Historic records of organic aerosols from a high Alpine glacier: implications of biomass burning, anthropogenic emissions, and dust transport” by C. Müller-Tautges et al.

Anonymous Referee #1

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The paper by Müller-Tautges et al describes the concentrations of various organic compounds (α -dicarbonyls, acids) and ions (calcium, oxalate, formate) analyzed from ice core samples drilled in Grenzgletscher, in the southern Swiss Alps. The ice core covers the period 1937-1994 and the dating accuracy is ± 2 years for the time before 1970 and ± 1 year after that. Source apportionment was then applied for the results in order to detect the influence of anthropogenic and biogenic emissions and forest fires to the aerosol composition in the past years. The information received is valuable since usually the chemical data from ice cores is from polar areas and not from populated

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areas. The paper is well written and clear and I think it is suitable for publication in ACP after minor corrections. The analytical details as well as sampling procedure are described in detail. What raises questions is on what basis where exactly these compounds chosen for analysis? When one goal was to evaluate the contribution of forest fires to the aerosol load, alternatives would be levoglucosan or potassium, which are known tracers for biomass burning. Why were they not chosen? Another issue is the stability of the compounds in the snowpack. The organic compounds are known to undergo photochemical reactions in the snowpack. Is there any information concerning possible losses of the compounds after deposition? The source apportionment was applied for the results and it showed that biomass burning was the main factor influencing the composition of organic species in the ice core. Biomass burning factor also follows nicely the curve describing the burned area in Switzerland. Is the amount of forest fires so large that domestic wood burning is totally negligible in producing organic aerosols? Technical aspects: It would be clearer if the letter describing the Figures in figure captions would be in front of a sentence and not at the end as it is now.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 13747, 2015.