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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Primary and secondary biomass burning aerosols determined by proton nuclear magnetic resonance (H-NMR) spectroscopy during the 2008 EUCAARI campaign in the Po Valley (Italy)" *by* M. Paglione et al.

Anonymous Referee #2

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The manuscript by Paglione et al. investigated the primary and secondary biomass burning aerosols in the Po Valley, Italy, with two techniques of H-NMR and HR-ToF-AMS. Factor analysis was applied to the NMR spectra to identify major components of WSOC. Of particular interest, two factors representing fresh and aged biomass burning were resolved and these two factors are composed of different types of organic compounds. The results were further compared with those from PMF analysis of AMS spectra. Similarities and differences were compared and elucidated in detail. Because biomass burning is a large source of aerosol particles in the atmosphere, and the ag-

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ing of biomass burning organic aerosol is of great interest to atmospheric community. The results in this study provide new insights into the primary and secondary nature of biomass burning aerosols. The approach that combing H-NMR and HR-ToF-AMS is also relatively new, which could be a new focus of future studies. The manuscript is well written and I recommend publication on ACP.

I have one comment on factor analysis of NMR. The number of samples is 17, which appears too few for factor analysis. The high Q/Qexpected ($\sim$20, Fig. 5) for 5-factor solution indicates a large underestimation of error which should be addressed in the text.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 33343, 2013.