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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Interpretation of organic components from positive matrix factorization of aerosol mass spectrometric data" *by* I. M. Ulbrich et al.

B. Resson

britany@gmail.com

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Substantive comments:

Your conclusions mention "this does not mean that there are only three sources, but rather that sources with very similar spectra (e.g., gasoline and diesel engine emissions) cannot be separated in this analysis with UMR data." The paper doesn't directly discuss the anticipated relative emission activity in the vicinity of the Pittsburgh EPA Supersite. A reader might wonder whether diesel emissions there are commonly thought to be comparable in amount to gasoline emissions (or whether one of the two emission types may be insignificant). Another question is whether the rel-

ative amounts of these emission types vary substantially during the course of a day. This may mean that there can be interesting results from use of specific subsets of your 3199 time-averaged mass spectra. For example, in Fraser et al.: Separation of Fine Particulate Matter Emitted from Gasoline and Diesel Vehicles Using Chemical Mass Balancing Techniques, Environ. Sci. Technol., 37, 17, 3904 - 3909, 2003 (see http://pubs3.acs.org/acs/journals/doilookup?in_doi=10.1021/es034167e), gasoline emissions at their Texas site were predominant at 1600 to 1800 local time (aka rush hour) but not in the early afternoon. Clearly they had a highly constrained measurement venue (a tunnel). Also, diesel and gasoline emissions at the Pittsburgh EPA Supersite are not necessarily from vehicles. Still, there may be limitations to lumping all of the data, from all times of day, for the complete 7-22 September 2002 period. An example hypothesis is that the best solution would be different if you excluded data from times of day with peak gasoline emissions (possibly 0700 to 0900 and 1600 to 1800 local time on weekdays).

Other comments:

The sentence structure of "There is a local minimum at 4 factors another at 6 factors" (first paragraph of 3.1.1) looks nonstandard.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 6729, 2008.