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Interactive comment on “SoFi, an Igor based interface for the efficient use of the generalized multilinear engine (ME-2) for source apportionment: application to aerosol mass spectrometer data” by F. Canonaco et al.

Anonymous Referee #1

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This paper introduces SoFi, a front end for the ME-2 algorithm as applied to ACSM data. This is not the first paper to deal with this method and the data it produces is conceptually the same as previous publications. However, the real technical value of this paper is in defining the approach to performing the analysis and identifying the key parameters and diagnostics that must be considered, as well as providing an initial test of the software with real world data. As such, this will provide an important reference point for the ongoing development of the technique, in addition to simply providing a citation for third parties when they use the software. The subject matter is definitely

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within the remit of AMT.

This is generally a well written and concise paper that is not too heavy on technical details that have been covered by previous publications. It could easily have been longer and more in-depth, but I don't feel that doing so would be a requirement for publication. As such, I recommend publication subject to the following comments:

General: The only thing that is perhaps a little disappointing is that the authors chose to test it on an entirely new dataset and not perform any benchmarking against any datasets in the literature that have already been heavily studied with other receptor modelling techniques (the Pittsburgh dataset featured in the Ulbrich et al. and Zhang et al. papers or the Zurich datasets investigated in the Lanz et al. papers spring to mind). I don't feel this omission would be grounds for rejecting the paper, as the authors already present some pretty convincing results, but its inclusion would add a lot of value.

Title: I find this title misleading because the paper focuses on ACSM data, rather than AMS data.

Running title: This is a bit nonspecific. Suggest changing to something mentioning ME-2

Page 6411, line 15: PMF isn't so much a model in itself as an algorithm that employs a 2-dimensional data model.

Page 6411, line 19: Meteorological events that cause covariance don't necessarily hinder PMF as such other than by removing available signal. They are merely a source of variance that doesn't help PMF, as opposed to sources of variance that only affect individual factors such as source activity.

Page 6411, line 24 (and elsewhere): Part of me is not entirely comfortable with the term 'CMB', as this could easily be confused with EPA-CMB, which is a specific software package (http://www.epa.gov/scram001/receptor_cmb.htm). Unless, that is, the

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authors are saying the mathematical approach is identical, in which case they should be specific in this detail.

Page 6411: It should probably be added that ME-2 is particularly beneficial to the analysis of ACSM data, as compared to the AMS, it has a lower signal-to-noise ratio and cannot resolve peaks with different elemental compositions.

Page 6414, line 1: The authors should specify the model of the NO_x analyser and the method used for NO_x conversion, as instruments employing molybdenum catalysts, while common, are known to suffer artefacts from partial NO_z conversion.

Page 6416, line 8: 'typical' is a very subjective generalisation. I am aware of much more variations than this in publications, so I recommend the authors tone this statement down.

Page 6421, line 13: Was a minimum error imposed?

Page 6424, line 22: It should be pointed out that the fact that the CMB approach has the largest UEV is expected, as this is given the least freedom during fitting.

Page 6429, line 3: Change 'extend' to 'extent'.

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 6409, 2013.

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