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Interactive comment on “Distinguishing molecular characteristics of aerosol water soluble organic matter from the 2011 trans-North Atlantic US GEOTRACES cruise” by A. S. Wozniak et al.

Anonymous Referee #2

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The authors use electrospray ionization Fourier transform ion cyclotron resonance mass spectrometry for characterisation of water soluble OM molecular fraction of 24 aerosol samples collected as part of the 2011 trans-North Atlantic US GEOTRACES cruise campaign. The authors successfully applied PCA for a very large high resolution MS dataset and identified molecular characteristics of aerosols influenced by primary/secondary marine, continental combustion (North America), and continental dust (North Africa/Saharan dust) sources. The experiments of this work were carefully designed and executed. The paper is clearly written and the subject matter is appropriate for publication in ACP. I recommend the paper be accepted subject to technical

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corrections.

Technical remarks:

1) The authors used solid phase extraction PPL cartridges to remove salt content from the samples. This step generally results in the loss of compounds containing carboxylic groups. Most of the carboxylic acids are important constituents of the atmospheric aerosols and are characteristic for certain emission sources. Have the authors checked the recoveries of the representative organic compounds that are expected to be abundant in their samples (e.g., fatty acids that are characteristic for the marine emissions)? I realise that this may not be in the scope of the study; however, I would suggest making a short statement addressing the possible limitations associated with the use of this step.

2) The authors externally calibrated their instrument using fatty acids which is an abundant class of marine aerosol; however, I missed any discussions whether they were able to detect these molecules in the analysed samples. I am wondering whether the homologous series corresponding to fatty acids falls in to the cluster of ions corresponding to primary marine sources identified by PCA. The even to odd carbon ratio of these acids can be used to support their findings.

3) Fig 7 shows structures of several amino acids; the direct infusion analysis does not allow obtaining the structural (isomeric) information of the molecules. Unless these structures were confirmed by LC/MS analysis or other appropriate techniques I would suggest removing them from the figure. Moreover, I would add a few lines in the text clarifying that these compounds were identified tentatively.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 6427, 2014.

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