Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2018-10-RC3, 2018

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Source apportionment of atmospheric aerosol in a marine dusty environment by Ionic/composition Mass Balance (IMB)" *by* João Cardoso et al.

Anonymous Referee #1

Received and published: 2 April 2018

This study applied a method called IMB for source apportionment in Cape Verde, and compared the results with those from PMF. Essentially, the IMB method is nothing more than linear combinations of weighted concentrations of PM components. It might be acceptable to identify some factors with known and relatively fixed ratios between species, e.g. Na and Cl in sea spray and metals and oxygen in dust, however, it is of limited use when handling sources with similar components but varied weights. The factor of "non-carbonate Carbonaceous elemental and organic matter" showed exactly the limitation of this IMB method, as OC and EC may come from multiple anthropogenic sources but this method failed to separate them. OC is additionally contributed by secondary process which was also not able to identify by IMB. If performing well, PMF should be able

Printer-friendly version

Discussion paper

to identify the multiple sources for OC and EC, as evidenced in many other places in the world. The fact that the IBM results happen to be consistent with PMF ones is that the PM contributing sources in Cape Verde is quite simple, which cannot sufficiently justify that this method is also applicable in other places with complicated contributing sources. In contrast, PMF has seen successful applications around the world with distinct environmental conditions. Therefore, I consider the approach applied in this study had significant drawback, and the limited scientific significance of this study does not meet the standard of Atmospheric Chemistry and Physics.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2018-10, 2018.

Printer-friendly version

Discussion paper