

Interactive comment on “The contribution of anthropogenic aerosols to aerosol light-scattering and CCN activity in the California coastal zone” by D. A. Hegg et al.

Anonymous Referee #2

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General comment.

The receptor modeling presented in this paper is a worthwhile addition to the author's previous work in this area, as it provides evidence for the anthropogenic contribution to aerosols of interest for clouds (CCN) or for light scattering. The paper could be improved by addressing several minor points described below. A major concern I have is in the use of the PCASP as a surrogate for CCN. If the authors choose to retain this approach, I suggest expanding the discussion to explain more fully how the discrepancy between CCN and PCASP concentrations might affect the result. For example the authors state: “While the slope was only 0.3, suggesting far from complete closure, the

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variance structure of the CCN proxy is clearly similar to that of the CCN, the key issue for source apportionment.” This is inadequate to explain the impact of this approach on the source apportionment analysis for CCN. While the PCASP measures aerosols whose size makes them good CCN, it has a heated inlet and the sampling conditions in the instrument are likely to be far less controlled with respect to humidity in the instrument than is true for CCN spectrometers, which is likely to introduce another source of variance to the data. Another approach would be to use the PCASP instead of CCN in the study, i.e. to report on the Contribution of Anthropogenic Aerosols to Aerosol Light-Scattering and Accumulation mode aerosols in the California coastal zone. I recommend publication if the major and minor issues can be resolved adequately.

Minor Points.

All Acronyms should be spelled out the first time they are used.

“However, it has proven difficult to quantitatively deconvolute the impact of various aerosol types, even such a simple dichotomy as anthropogenic and natural, or their climatically relevant properties (e.g., light-scattering coefficient, CCN activity) proving to be somewhat obscure.” I don't understand what you are trying to say here. . .

Some of the figures would be improved if dates were used instead of case numbers.

References for the models that were used should be included when the models are first introduced.

“Biomass burning in the continental region adjacent to the CARMA operational area (offshore, marine cloud-topped boundary layer) is largely human-induced (either accidentally or through prescribed burns).” A reference is needed for this assertion.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 11483, 2010.

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