

## ***Interactive comment on “Aerosol decadal trends (I): In-situ optical measurements at GAW and IMPROVE stations” by M. Collaud Coen et al.***

M. Collaud Coen et al.

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We thank J. Sherman for his careful and encouraging review and for his comments on the paper that we have taken into account in the revised version.

General comments:

- The reviewer mentioned the limitation of the study concerning the few absorption coefficient datasets analyzed, principally in the continental US. As mentioned in the paper, the SGP PSAP data could not be used on the request of the data owners due to an artificial influence of the measurement by high frequency humidity changes due to air conditioning cycling. No further long-term absorption datasets with good QC checks have been submitted to the international data centers. The authors are aware of some other absorption datasets (Alert, Cape Grim, Egbert, Amazonia, Sao Paolo,..), but, apart from the fact that they were not submitted to international data centers, they are most of the time either too short or do not correspond to remote sites. It was decided in this project to stay in the “realm” of the data publically available in international databanks and not to initiate individual “demarches” to obtain other datasets with perhaps not well-defined QC.
- The authors are aware that single scattering albedo (SSA) trend analyses would have been very important contribution regarding climate change. However, as mentioned in the paper, both AE and PSAP suffer from several well-known but important measuring artifacts and, at least for AE instruments, no correction algorithm has been globally approved by the scientific community. In the absence of a consensual view and because of the number of different AE models used in this study and of the difficulty in measuring very low absorption coefficient at several sites, we decided not to published SSA values and trends. Once the datasets using the MAAP are sufficiently long, SSA trends could be analyzed with much more confidence.

Specific comment:

- The mentioned passage p. 20804 lines 10-20 has been fixed according to reviewer’s suggestion. The purpose of the original sentence was to say that there are s.s. trends in Arizona, but that they are not consistent with each other. The sentence has been modified for clarity:  
“The calculated trends in scattering for the five sites located in the arid state of Arizona (HGC, SCN, IBB, PAZ and SIA) are not consistent with each other.”