Response to the reviewers

Anonymous Referee #1

Received and published: 31 January 2011

Paper is well written, factual and concise. The observations reported and assessed are unique, providing new information on aerosols over marine regions around the world. Proper attention is given to error estimates and data quality of the reported observations. Comparisons made with global aerosol models and satellite retrievals are fair and balanced. All in all an excellent paper.

Thank you for the kind words.

Anonymous Referee #2

Received and published: 31 January 2011

This paper presents unique and valuable results from first analyses of aerosol optical depth (AOD) measurements acquired with ship-borne handheld Microtops suphotometers that comprise the Maritime Aerosol Network (MAN). At the time of writing, more than 80 cruises had either been completed since 2004 or were ongoing. The authors analyze the latitudinal dependence of AOD by grouping the data into six geographical regions: Atlantic Ocean, Pacific Ocean, Indian Ocean, Southern Ocean, the inland seas (Baltic, Black, Mediterranean), and the Bering and Beaufort Seas. They present frequency of occurrence graphs for these regions for daily averaged AOD, Angstrom parameter, and coarse mode fraction, in addition to composite values for all oceans excluding the inland seas. Finally, they investigate the latitudinal dependence of AOD differences between various global aerosol transport models and the sunphotometers, and between various satellite sensors and the sunphotometers.

The manuscript is extremely well-written and should require very little revision before final publication.

Thank you for the kind words.

Reviewers are often quick to suggest elimination or consolidation of figures, but I have the opposite view in this case. Although certainly not critical, the authors might consider adding a figure that plots latitude vs. Angstrom parameter – that is, comparable to their Figure 3 for AOD.

We appreciate the suggestion to include a figure that plots latitude vs Angstrom parameter but we decided against the plot because it shows a noisy pattern in regions of low AOD (i.e., Angstrom parameter variability increases when AODs approach the magnitude of the AOD uncertainty), and would not add much to our arguments. Providing a histogram for each region is considered more useful since it provides the full distribution and helps modeling aerosol optical properties over various regions.

In the first paragraph of Section 4 (Page 12), the authors note that the MAN Level 2.0 data "were spectrally adjusted using log-linear interpolation to the 'validation' wavelength of 550 nm." Why the choice of log-linear instead of log-log interpolation, which seems more in keeping with an assumed Angstrom spectral dependence? It is doubtful that this would make much difference over this wavelength range.

It was a typo, in fact we do the log-log interpolation with linear fit.

Prior to final submission, I suggest the following minor edits:…

Many thanks for those. All the edits were taken into account. We chose not to change "frequency of occurrences" because we've been using this terminology for a long time.