

## ***Interactive comment on “The Climatology of Australian Aerosol” by Ross M. Mitchell et al.***

### **Anonymous Referee #3**

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This is a valuable paper, and I am more than happy to recommend its publication in ACP. The data/climatology presented should be of interest to many scientists working in aerosols, and climate modelling. I have only a few small suggestions. Section 2 consists of a comparatively long “introduction”, followed by a much shorter subsection 2.1. I feel the paper would be slightly more readable if that introduction were to be subdivided into 1 or 2 subsections, with appropriate headings to guide the reader. I found the concept of fitting both an annual cycle, plus two higher harmonics, quite interesting. However, an alternative way to characterize double-peaked data is to use two (or more) annual cycles with different phase angles. The reference list is comprehensive, however an additional reference the authors might like to consider is Bouya et al., *Journal of Atmospheric and Solar-Terrestrial Physics*, vol. 72, 726-739. I have one final thought for potential further work. The authors identify three aerosol ‘groups’: tropical, arid and temperate. Might it be possible to generate spatio-temporal patterns for each, perhaps via a “grand fit” to the data? (This would be somewhat similar to

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EOFs.) This would then allow spatial interpolation of the climatology, although perhaps not extrapolation to Victoria and Tasmania.

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