

Interactive comment on “Mineral dust variability in central West Antarctica associated with ozone depletion” by M. Cataldo et al.

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Received and published: 14 August 2012

General Comments: This is an interesting paper that provides a convincing analysis of microparticle concentration decreased by strengthening westerly winds while the size of the deposited particles is increased by stronger storms. Some issues do need attention however, and these are outlined below.

Specific Comments:

1. I would not term the Mount Jones site as being in central West Antarctica. Rather it is in the far eastern part of the West Antarctic Ice Sheet (see Fig. 6) if one excludes the Antarctic Peninsula.
2. It is important to remember the observed seasonality of the trends in the SAM. They

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are pronounced in the summer and fall but near zero in the winter and spring. There is a delay between ozone depletion in the stratosphere and the impact in the troposphere. How does the seasonality in the SAM behavior relate to microparticle concentration, i.e., when do you think these particles are primarily deposited?

3. In Figure 1, tell us precisely what smoothers were put through the data points. Justify this degree of temporal smoothing. In (f) what AAO (SAM) index values are plotted? Annual or DJF?

4. In Figure 2, you have compared observed annual wind speed changes (after versus before 1979) versus a stratospheric ozone depletion simulation contrasted with a steady ozone concentration simulation for 1994-2004 from one chemistry-climate model (annual zonal wind stress difference shown?). First you should explain more carefully what is being compared. Second, would different models show the same results? Note contrary to your text, Mirny shows a wind speed decrease while the model shows an increase. Also from page 12698 “complied wind data show enhances in 64% of the stations after 1979” – “enhances” means “increases”?

5. I would like to see a discussion of the schematic in Figure 6 compared to temperature trend analyses of Steig et al. (2009) and O’Donnell et al. (2011, J. Climate); these analyses imply variations in the marine air penetrating West Antarctica. Nicolas and Bromwich (2011, J. Climate) also discuss the influence of marine air in West Antarctica. Are these analyses consistent with your conclusions?

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 12685, 2012.