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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Long term changes in the upper stratospheric ozone at Syowa, Antarctica" *by* K. Miyagawa et al.

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1. In Fig. 8, you showed the negative correlation between ozone and temperature (November) in the high stratosphere (2-5 hpa). As you may know, however, Solomon et al. (2005) shows the 'positive' correlation between ozone and temperature. The difference is that Solomon et al. (2005) showed results for October and 70 hpa height at maximum. I don't think this time and height difference make the opposite results. Solomon et al. (2005) explained the positive correlation based on the extent of wave activity according to the temperature (so in terms of low-frequent dynamic variability) and mentioned that the data at Syowa does not seem to be influenced by these low-frequent pattern. So now I guess your negative correlation implies the strong relation of polar stratospheric cloud. Is it right? (I cannot reach to your conclusion for this

correlation between ozone and temperature). If right, then you need to discuss the influence of stratospheric wave activity to the ozone variability carefully.

2. Including the introduction, you suggested many factors influencing the variability of stratospheric ozone such as ODS(or EESC), SAM, ENSO, QBO, solar cycle, wave propagation, etc. Then which one explains the stratospheric ozone variability best? In other words, I don't reach which is the main factor we need to consider for the analysis of ozone variability. If you want to mention the impacts by all these factors, I think there is another better way to show the evaluation or comparison of all these factors.

3. It seems better to comment the meaning of layer number in the section 2 (ozone data sets) or the caption of first figure. I'm confused whether larger number layer means high altitude or not and there is no specific information of layer height (only commented layer 8+ is higher than 4 hap), making difficult to read Table 2 and 4.

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