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Atmospheric Chemistry and Physics Discussions

Interactive comment on "On recent (2008–2012) stratospheric aerosols observed by lidar over Japan" *by* O. Uchino et al.

Anonymous Referee #1

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General Comments:

The paper "On recent (2008-2012) stratospheric aerosols observed by lidar over Japan" submitted to the Atmos. Chem. Phys. Discuss. (ACPD) by Uchino et al. provided a study of the effect of moderate (VEI-4 type) volcanic eruptions on aerosol loading in the lower stratosphere by analyzing surface lidar observation at two locations in Japan. The result is consistent with other similar studies based on satellite lidar and other surface lidar observations. Even though the approach and results are not different from other lidar based studies on the same subject in the literature, the independent surface lidar observational data and the analysis presented in the paper are valuable for the community of stratospheric study. The progress of our understanding of stratospheric aerosol changes will benefit from this kind of data collection

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and associated analysis. The paper is in a good shape but further improvement can be achieved through a minor revision by providing explanations on some interesting features revealed in the data, which will be listed in the following itemized comments.

Itemized Comments: 1)Page 22760, 3rd Paragraph (lines 13-22): Even though stratospheric aerosol increase after 2002 has been reported by both Hofmann et al. (2009), Vernier et al. (2011), etc., but there are two different explanations on the cause of the increase (one is due to anthropogenic emission and another is due to volcanic eruptions). The review presented in this paragraph should indicate clearly these two different explanations.

2)Page 22764, line 16: Why IBC decreased quickly within a week over Saga? Some explanation (or reasonable speculation) should be provided.

3)Page 22765, lines 16-17: Why the enhanced stratospheric aerosols due to Mt. Merapi volcano was not detected shortly after the eruption but can be observed several months later as shown in Fig. 7?

4)Fig. 7 and associated texts on pages 22765 and 22766: As author indicated that 1997-2001 is a volcano quiescent period but some moderate volcanos erupted after 2004. Thus the transition period from 2002 to 2005 becomes an interesting time period since the anthropogenic emissions and volcanic eruptions may play competitive effect in the lower stratosphere. Thus, it would be interesting to extend the time coordinate of Fig. 7 back to 2002 so that we may be able to find out when the volcano effect starts to pick up and become dominant.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 22757, 2012.