

Interactive comment on “Nabro volcano aerosol in the stratosphere over Georgia, South Caucasus from ground-based spectrometry of twilight sky brightness” by N. Mateshvili et al.

Anonymous Referee #1

Received and published: 17 May 2013

The paper presents nice observations of twilight sky measurements to retrieve the upper troposphere and lower stratosphere aerosols extinction. The paper is interesting and must be published, but it needs some revision, taking into account the following comments:

Measurements at two different periods are presented: Oct. 2009 – August 2011 and 1991 during Pinatubo event (with a re-analysis of “old” measurements). The link between the two periods is hard to follow. I understand that the authors want to present various measurements obtained in different conditions, but the actual presentation gives the feeling that 2 different papers are mixed together. I suggest adding few sen-

C959

tences to explain why observations obtained 20 years apart are presented and can be compared to the new ones.

Page 2 lines 15-17: The authors (shortly) refers to some satellite measurements; they can add references to balloons and aircraft measurements on the stratosphere free of volcanic aerosols coming from major eruption (e. g. Renard et al. (2008), *J. Geophys. Res.*, 113, D21303, doi:10.1029/2008JD010150).

Page 8 lines 19-23: This approach works well for spherical aerosols, but can be inaccurate in case of solid particles. There are solid particles in such part of the atmosphere, as shown by many papers (e. g. Blake, D. F., and K. Kato (1995), *J. Geophys. Res.*, 100, 7195-7202; Murphy et al. (1998), *Science*, 282, 1664-1669). How the presence of such particles could bias the retrieval, or add some uncertainties?

Page 15 line 5: The presented extinction curves could be validated by balloon or satellites measurements. I understand that it is a long job to find a good coincidence between the observations presented here and balloon/satellite data. Nevertheless, a short discussion showing that the retrieved extinction values are of the same order of mean extinction values obtained during Pinatubo period and during the recent period is necessary.

Page 16 lines 11-18: The authors say that Japan lidar measurements are in good agreement with their results. Same conclusions are given with OSIRIS measurements. A figure showing the comparison, or a table with hard numbers, must be provided to convince the reader.

Figure 14: The x-scale legend is missing.

Figures 15 b and c: The figures are too small and are difficult to read.

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 4401, 2013.