

Interactive comment on “Lidar observation of the 2011 Puyehue-Cordón Caulle volcanic aerosols at Lauder, New Zealand” by K. Nakamae et al.

Anonymous Referee #2

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This manuscript presents lidar measurements at Lauder, New Zealand of stratospheric volcanic aerosols of the Puyehue-Cordón-Caulle eruption in 2011. The paper is well written and method and results are well presented. Therefore I recommend publication in ACP after consideration of few (mostly minor) comments:

Abstract:

Line 5-6: As this study seems not the main focus of the paper, it should not be stated here.

Line 8: The authors should already indicate here that they consider linear depolarization.

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Line 9: Is this the volume or particle depolarization?

Section 1:

Page 13466, line 23-24: Give a reference for that statement.

Page 13467, line 14-16: The references do not only consider small particles but also large volcanic ash particles.

Page 13467, line 17-19: Give the explosivity index

Section 2:

Page 13469, line 14: Give an explanation and reference for the assumed lidar ratio.

Section 3:

The authors assume aerosol free regions at about 30 km altitude and found low R-values (about 1.09) in the stratosphere (except in the volcanic aerosol layer) indicating aerosol free regions. However above the volcanic aerosol layer the total depolarization ratio (Fig. 1, 4, 6) is about 2%. What is the reason why the total depolarization differs from the molecular depolarization ratio assumed in this aerosol free regions?

The particle depolarization ratio shows no constant value in the volcanic aerosol layer. Do the authors expect vertical variability of the microphysical parameters inside the volcanic aerosol layer (page 13472, line 25-28)? How could that be explained?

What is the lowest R value for reliable analysis of the particle depolarization ratio?

The authors should give a comprehensive error analysis of the retrieved properties, especially of the particle depolarization ratio, to avoid drawing wrong conclusion of the retrieved results.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 13465, 2014.

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