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Comment

# ***Interactive comment on “The environmental impact of the Puyehue-Cordon Caulle 2011 volcanic eruption on Buenos Aires” by G. B. Raga et al.***

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The environmental impact of the Puyehue-Cordon Caulle 2011 volcanic eruption on Buenos Aires, by Raga et al.

General Comments.

This manuscript presents measurements of aerosol backscattering, concentration and AOT over the city of Buenos Aires during days when volcanic clouds from the 2011 Cordón Caulle eruption passed over the city. In addition, it also presents some data suggesting that ash clouds could affect local meteorology (decrease of surface tem-

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perature and relative humidity). As demonstrated during the passage of the 2010 Eyjafjallajökull clouds over Europe, this paper shows again the potential of ground-based aerosol instrumentation (typically deployed for meteorology and air quality objectives) to detect and reconstruct the vertical structure of volcanic clouds. The manuscript is clearly written and presented. For these reasons I recommend publication after some issues (see below) have been addressed.

#### Specific Comments.

- Results are presented only for one episode occurring on 1-2 July. Why this particular one? Considering that the eruption was more intense during the first 3 days (4-6 June), the clouds reaching BsAs on 6-7 June could probably be a much better study case. The authors should say if there is any particular reason for not showing results during these days (may be presence of meteorological clouds impeding observations?)

- Results from Fig. 4f and 4g are very interesting. Measurements are always below one standard deviation, indicating a possible influence of the cloud on local meteorology. However, a temperature decrease of 4C (P1516:L4) seems large, and I wonder to which extent this value depends on the averaging period (which includes much colder months). I would suggest the authors to work more on this. For example, is this decrease also observed during the other episodes?

- The authors mention in many parts of the text that that they analyze “particle properties” (e.g. P1511:L13, P1515:L4, P1514:L7, etc). However, they do not measure aerosol physical properties (e.g. size or shape) but only optical properties and particle mass/number concentration. This adds some confusion. I am not an expert in aerosol measurements but to my knowledge, measurement of physical properties requires of multi-wavelength instrumentation (e.g. to determine the Amstrong exponent), which was probably not available here. This, and the limitation of their measurements to discriminate aerosol types, should be mentioned.

- The source of PM10 concentration measurements is not discussed nor mentioned in

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Table 2. Is it an air quality station? Please give some more explanations in P1514:L7.

Technical Corrections.

- Change “volcanic plume” to “volcanic cloud” throughout the text.
- P1509:L7. “began an eruptive process on” → “erupted on”
- P1509:L7. Specify if 2.45pm refers to LT or UTC.
- P1509:L8. The eruption was NOT from Puyehue strato-volcano but from vents in the Cordon Caulle volcanic complex. This error is repeated several times in the text. Please correct.
- P1509:L8. “Southern Volcanic Zone” → “Southern Andes Volcanic Zone”
- P1509:L24-26. To be precise, the responsible for issuing warnings in the South of South America is the BsAs VAAC, hosted by the Argentinean Weather Service.
- P1513:L15. Eq(1) should read 0.553 according to Fig 1.
- P1513:L15. Here I do not understand well. The fit to compute the extinction from the backscattered power is derived from measurements between 20-60m and then used at all heights up to 7km (eq.1)? Is this correct?
- P1514:L4. “particle properties” → “particle optical properties”
- P1514:L22. Figures 2 and 3 show meteorological data. From which source?
- P1516:L7. Volcano days → days with volcano influence
- P1518:L5. Check English
- P1518:L22. Heights of 10km occurred only during 4-6 June. The eruptive column was much lower afterwards.
- P1522:L5. Not so sure about this conclusion. AOT measurements from different sources do not seem very consistent from Fig7.

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- Table 2. I would add a column showing the frequencies of measurement for PSAP, nephelometer and ceilometer. Also, other instrumentation not deployed at UBA (AERONET, MODIS) could be added.

- Fig 4. No color-scale provided for Fig4a

- Fig 7. Do not understand the green code on day 191...ceilometer measurements are much higher than during other days marked in red or yellow...

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