

Interactive comment on “Modeling volcanic ash resuspension – application to the 14–18 October 2011 outbreak episode in Central Patagonia, Argentina” by A. Folch et al.

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Overall

Nice paper on modeling re-suspension of ash. This has not been a major focus on research and it is good to see that it is being examined and the work included in the published literature. This has a good comprehensive review of the different emission schemes used in the work and available for the re-suspension of volcanic ash. The paper needs more references to section 4 on the actual re-suspension event and what the effects were on the local region. Also would be good to include photographic evi-

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dence of the effects on visibility for example. Otherwise, I can agree that this paper is suitable for publication after the suggested changes in this review.

Specific

P4567, Line 4 – what is meant by huge? This is in terms of area, or amount?

P4567, Line 8 – edit to change having to with

P4567, Line 14 – FALL3D. Is this an acronym? If so then needs to be defined

P4567, Line 16 – WRF-ARW needs to be defined as this is acronym and this is first use in the text

P4567, Line 24 – do you have a reference to the concern to human health?

P4568, Line 1 – did Baxter (1999) shows this or just describe it? If they just described it then it would be better to say (see Baxter, 1999)

P4568, Line 2 – edit to say (see Guffanti et al., 2009)

P4568, Line 4 – needs a reference that re-suspended ash can be dispersed large distances

P4568, Line 6 – change to read (such as strong winds. ...

P4568, Line 6 – edit to read (such as low soil.

P4568, Line 7 – needs a reference to enhancement under both fresh and relic ash fallout deposits

P4568, Line 8 – edit to read ‘example, favorable meteorological conditions occur during’

P4568, Line 9 – edit to read ‘2003, that caused continuous resuspension’

P4568, Line 14 – what is the country here for Patagonia?

P4568, Line 15 – what is the country here for Patagonia?

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P4568, Line 18 – edit to read ‘decades, and gained heightened interest in the aftermath’

P4568, Line 19 – change to read ‘aviation impacts following’

P4568, Line 21 – these have been called volcanic ash transport and dispersion (VATD) models and TTDM is personal taste

P4569, Line 6 – NAME needs the full acronym as first used here in the text

P4570, Line 3 – in the term considerable, how much?

P4570, Line 3 – edit to read ‘uncertainty as NWP models’

P4570, Line 4 – edit to read ‘deposits, which can substantially alter moisture’

P4571, Line 8 – who defined the wind friction velocity?

P4571, Line 8 – what are the soil properties that the velocity depends on?

P4571, Line 10 – edit to read ‘elements on the ground’

P4571, Line 11 – edit to read ‘rocks or vegetation’

P4571, Line 12 – what do you mean with the term ‘absorb part of the momentum of wind’

P4571, Line 15 – edit to read ‘Simple dust emission schemes’

P4571, Line 19 – make two sentences so it reads ‘0.01 mm h⁻¹. The cut-off’

P4571, Line 21 – remove bracket as suggested to be two sentences

P4571, Line 24 – edit to read ‘is expected at more distal locations. In order’

P4572, Line 8 – where in the text does the Iversen and White, 1982 reference too? Is it the densities and/or the diameters?

P4573, Line 12 – edit to read ‘Note that particles in the range of 30-200 μm are more

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likely suspended’

P4574, Line 13 – edit to read ‘The simplest dust emission’

P4576, Line 10 – add in so reads ‘In this study,’

P4577, Line 1 – edit the section title to read ‘The 14 -18 October 2011 resuspension event’

P4577, Line 6 – do you have a reference to the winds blowing over Patagonia in the spring?

P4577, Line 6 – edit to read ‘The small villages spread sparsely across’

P4577, Line 8 – edit to read ‘were heavily impacted by this’

P4577, Line 12 – do you have a reference to the wind speeds and gusts?

P4577, Line 13 – what do you mean by huge ash cloud? Size or amount of ash?

P4577, Line 15 – do you have a reference to how the impacts occurred at a national level?

P4577, Line 17 – add into the bracket that the location can be seen in Figure 2

P4577, Line 18 – do you have references to the accidents?

P4577, Line 18 – I am not sure what you mean by ‘disruption hardly harmed’

P4577, Line 19 – do you have a reference to the southern part not being disrupted?

P4577, Line 21 – edit to read ‘on the early morning of October 16’

P4577, Line 21 – also you will need to state what time zone you mean for early morning

P4577, Line 23 – do you have reference for blanketing of the city

P4577, Line 26 – full name of EPA?

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P4577, Line 27 – full name of GCBA?
P4578, Line 2 – do you have reference to the ash at low atmospheric levels?
P4578, Line 3 – where are the two airport on Figure 2?
P4578, Line 4 – do you have a reference to the 146 flights cancelled?
P4578, Line 7 – do you have a reference for the operations not resuming until 17th?
P4578, Line 8 – do you have a reference for 40 cancelled flights?
P4578, Line 9 – do you have location for the 3 airports?
P4578, Line 16 – you need full name for 4-D
P4578, Line 16 – switch furnished with generated
P4578, Line 18 – remove ‘along others’
P4578, Line 19 – change so reads ‘capabilities resolve a’
P4578, Line 19 – do you have reference for FALL3D-7.0?
P4579, Line 10 – edit to read ‘break upon grounding’
P4579, Line 13 – edit to read ‘proximal deposit’
P4579, Line 15 – include above sea level for height
P4579, Line 16 – include above sea level for altitude
P4579, Line 18 – include full name of SE
P4579, Line 18- who observed the deposition lobe in the field?
P4580, Line 9 – do you think the results show a good agreement? What is the correlation?
P4580, Line 12 – has it been shown that the NWP model does not resolve the breeze

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effects. If you make this statement then you need some more evidence to back it up.
P4580, Line 17 – in Figure add a vertical line for the event times as then it will be easier to read and interpret Figure 5a
P4580, Line 26 – add in above sea level to altitudes
P4580, Line 26 – edit to read (model layer thickness increase gradually in order to have finer resolution. . . .
P4581, Line 2 – what is the significance of the 250m injection height?
P4581, Line 5 – what is the significance of fixing the maximum size to 250 μm ?
P4581, Line 10 – what is full name of CMAQ?
P4581, Line 15 – here you have a list and need to include (1), (2), (3) and (4) for each of the items you list
P4581, Line 18 – no need to include the ‘etc’
P4581, Line 19 – edit to read (see Table 1 for location information)
P4582, Line 17 – have GOES and NOAA been defined earlier? If not then they need the full names here
P4582, Line 21 – it is very hard to see the different parts of Figure 7. I have provided some input on how to make changes later on in the section on figures
P4582, Line 22 – you don’t need to say this if you don’t show it.
P4582, Line 22 – edit to read ‘The model predicts the formation and evolution of the cloud matching the satellite data, and shows how’
P4583, Line 1 – edit to read ‘which was detected and reported by the VAAC’
P4583, Line 16 – include above ground level with the height

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P4583, Line 16 – I am not sure what you mean by decoded information. Please edit this statement

P4584, Line 6 – what does FH62 C14 mean?

P4584, Line 8 – what do you mean 'stick'?

P4584, Line 11 to 15 – why include this as you say at the end that you did not have enough good quality data. This can all be removed as it does not assist the analysis or conclusions drawn from the results.

P4584, Line 16 – it is hard to read all 15 different graphs from the figure. I've made suggestions in the figures section on how to improve this.

P4584, Line 20 – re-order to say 'the model correctly predicts'

P4585, Line 3 – you say that the data matches to a factor of 2. This is a significant difference given that the data have small values in comparison to the difference factor. A factor of 2 when the value is 2 is a very significant difference between the data.

P4585, Line 18 – edit to read 'In fact we also analyzed results using'

P4585, Line 18 – edit to read 'correction, and found this gives' Tables

Table 1 – edit the title to read 'Location and altitude information of the stations used for the ground observation comparisons. Meteorological.'

Figures

Figure 1 – needs μ included in the x-axis. Also needs the full name for WE so that the caption can be read without needed to find the full name in the text

Figure 2 – needs the full name of CCVC so that the caption can be read without needed to find the full name in the text

Figure 3 – in the caption deposit load in kgm-2

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Figure 4 – needs (a), (b) and (c) in the caption for the three sites

Figure 5 – Good

Figure 6 – would be easier to read if the Date is only include once per day and spreads across the 24 hour period.

Figure 7 – this needs to be split into separate figures as each part is too small as one figure. Really needs 5 figures one for each day.

Figure 8 – Each station information is too small and so very hard to read. Should be split into maybe 3 figures, each with 5 stations. Then one will be able to read the data.

Figure 9 – needs some information to explain the significance of the points below or above the 1:1 line. Also some thought onto the larger variation with time the longer the model simulations occurs. At the top of the graph, there are times when the model is forecasting it too early and others too late. Ny thoughts to this?

Figure 10 – each of the different graphs are two small and it is hard to read the axes. Look at a way to make it easier to read.

Figure 11 – Good

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