Nat. Hazards Earth Syst. Sci. Discuss., 1, C1628–C1631, 2013
www.nat-hazards-earth-syst-sci-discuss.net/1/C1628/2013/

Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Tephra hazard assessment at Mt. Etna (Italy)" *by* S. Scollo et al.

S. Scollo et al.

scollo@ct.ingv.it

Received and published: 5 November 2013

Dear Dr Pistolesi, thank you for your comments. We revised the paper taking into account your valuable remarks. Herein, we report the specific Reviewer comments and our answers.

-Introduction Although the OES-WLL maps were compiled based on the 2002-03 eruptive period, a brief update of the eruptive activity of the volcano during the past (2011-2013) years should be inserted (number of events, dispersal: : :).

A sentence that reports the past Etna eruptive activity (2011-2013) was added to the Introduction chapter.

-line 14 (2948) please stated which data were used in this work.

We added some references to the text.

-Model Data wind profiles are every 6h, which in some cases can be a long interval, particularly during long-lasting events. Are there any additional information for the 2001 case study presented as described for the 1998 event? (visual observations on variations of plume height or plume direction).

Radio-sounding data are given with a 6 h step. However, the same dataset was also used to simulate the 2001 long-lived eruptions and comparisons among model results and observations were in very good agreement (see also Scollo et al. 2007). Furthermore, for the 2001 Etna eruption, the column height and wind variations can be found in Scollo et al. (2007).

- Hazard assessment The 5 January 1990 event has been classified as suplinian on the basis of the collection of some samples. However, the deposit shows a rapid decrease in thickness (from 4 m in proximal area to 9 cm at 6 km) which is uncommon for subplinian events. Since the 1990 eruption has been taken as a case study for SSL type, the authors should briefly comment if these features are common for subplinian events at Etna.

The reviewer is right. The eruption was not classified on the base of Walker's classification. Consequently, the sentence that describes the eruption as sub-plinian was deleted.

-Please be consistent in order to facilitate the readers in the comparison of the different reference events (mass of the 1990 event is expressed in kg, the 122 BC in km3, the 2002 in m3).

The 122 BC and the 2002-03 eruptions are now expressed in kg and a new table including the eruption source parameters was added in the revised version of the paper.

-Discussion The authors stated that TEPHRA does not reproduce the deposit within the corner, with greater differences between 1.8 and 3.8 km. However, for SSL events

fig. 2d shows large discrepancies also for low mass loading (around or below 1 kg/m2) of the same order of the deposit within the corner, and fig. 3 large discrepancies at 22 km. For WLL events, on the contrary, fig. 5 highlights overestimation of the fine fraction for distances 4 km. Although the best fit is still within 50%, this point should be better clarified at least in terms of possible over- or underestimation in the final maps presented in the work. There are also difference with low mass loading (below 1 kg/m2).

Model caveats and uncertainty estimations of the hazard assessment were added in the discussion chapter.

-Technical corrections

-line 22 (2956) replace ligh with light

Corrected as requested.

-line 23 (2957) replace that with who

Corrected as requested.

-lines 27 and 28 add deposit after tephra and after thick

Corrected as requested.

line 15 (2958) high instead of tall

In agreement with the reviewer 2, tall was deleted.

-line 17 replace falls with fell

Corrected as requested.

-line 26 dot is missing after a.s.l.

Corrected as requested.

-line 29 add the before volcano

Corrected as requested.

-line 21 (2959) replace makes with made

In agreement with the reviewer 2, “made” was replaced with “compiled”.

-line 4 (2962) replace evaluete with evaluate

Corrected as requested.

-line 15 replace occurs with may occur

Corrected as requested.

-Please replace www.dbstr.ct.ingv.it/iavcei/ with http://dbstr.ct.ingv.it/iavcei/

Corrected as requested.

Reference

Scollo, S., P. Del Carlo, and M. Coltelli (2007), Tephra fallout of 2001 Etna flank eruption: Analysis of the deposit and plume dispersion, J. Volcanol. Geotherm. Res., 160, 147–164, doi:10.1016/j.jvolgeores.2006.09.007.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 2945, 2013.