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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "PM_{10} measurements in urban settlements after lava fountain episodes at Mt Etna, Italy: pilot test to assess volcanic ash hazard on human health" *by* D. Andronico and P. Del Carlo

Anonymous Referee #2

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GENERAL COMMENTS

The manuscript describes the measurements of PM10 ash in the atmosphere as a consequence of ash emissions from Etna volcano and, in particular, from the 15 November 2011 episode. The measurements were carried a few hours after the beginning of the eruption and repeated, in the same places after one month (in absence of ash emission).

Results show that, after one month, the concentration of PM10 in the atmosphere is low, compared to the measurements carried out during ash emission.

The paper is interesting, but the limits of the measurement procedures and the reported data need to be commented. In particular, the presence of PM10 in the atmosphere is mainly related to two main processes: 1) the deposition of ash on the ground; 2) the grinding of the ash with production of the fine ash and its resuspension due to the passage of the cars on the roads. The tephra deposit is described by its loading, the size distribution and characterization of the particles. This part is sufficiently described in the paper. However, the effect of the production of PM10 by abrasion of the ash due to the passage of the cars and its resuspension in only marginally described. The secondary production of fine ash seems to be an important factor. In fact, samples collected at SITES 2 and 3 (see figure 4d) mostly contain coarse particles (about 1-2 mm in diameter) with a negligible component of PM10 in the falling ash. Moreover, the resuspension depends on atmospheric turbulence, including that generated by the wind and that induced by the passage of the cars. These two processes (grinding and resuspension) are not quantified by the authors and, for this reason, the measurements are difficult to interpret. Moreover, ash concentration was measured at different heights form the ground in the three sites. For this reason, the measurements are difficult to compare. I suggest the authors to shortly describe the limits of the measurements and the possible sources of uncertainties.

SPECIFIC COMMENTS

- Line 144: PM1, PM2 and PM3 ... do you mean SITE1, SITE2 and SITE3?
- Paper Horwell et al., 2006, cited at line 40 is not reported in the bibliography (do you mean Horwell and Baxter, 2006?).
- Paper Andronico et al., 2009 cited at line 55 is not reported in the bibliography

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- The document (EU, 2001) cited at line 209 is not reported in the bibliography; instead it is reported (EU, 2008).
- Document WHO, 2005, cited at line 225 is reported in the bibliography as WHO, 2006.
- Papers Damby et al., 2013 and EU (2008), reported in the bibliography are not cited in the text. itemize

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 3925, 2015.