

## ***Interactive comment on “Revisiting the statistical analysis of pyroclast density and porosity data” by B. Bernard et al.***

**B. Bernard et al.**

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General comments:

#1: model formats: we provided a R code because of several advantages: 1) R is a freeware so the potential users of our code don't need to purchase a licence (unlike MatLab and Excel); 2) in order to use our code, the potential users don't need a deep knowledge of how R work, they just need to know how to prepare the files and the commands to run the code provided in the text; 3) some of the statistical analysis tools provided in this code such as the stability analysis are not possible to reproduce in a spreadsheet format. Nonetheless we think that the reviewer is right when he states that in order to promote a standardised analysis we should provide this tool for different platform. To answer the reviewer comment we propose to include an Excel

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spreadsheet with basic statistics and weighted statistics. We also translated the whole R code in MatLab format. In addition the R code has been commented adequately in order for potential users to understand better how it works.

#2: Section 2.5 – Graphical statistics: This is not a discussion section, it is a methodology section that make clear reference to the origin of the formulae. The formulae are not new but it is the first time that they are used for density/porosity data analysis. We agree that it might not be sufficiently clear in the text and propose some modification to it (see new text) but we think that the formulae are in the adequate section. The graphical statistics are only inferior for two parameters, median and mean, but for the other they provide a new important information (see section 3.3). Maybe the text is not clear enough on this point. We included a sentence to stress this.

#3: Discussion #3a we agree with the reviewer, this section has been modified including a deeper bibliographic investigation in order to illustrate the interest of our approach. The main issue is that there are too few published database to include a quantitative effect of previous models. Also we would like to keep the text short as it is a short communication. #3b the reviewer raise an interesting point. We think that in the future, when more raw data are available, if this analysis is used on different deposits it will help suggesting a minimum number of clasts for each kind of deposits. We thought this was clear in the text and made some modifications to the text to make it clearer.

#4 Punctuation after equations: we agree with the reviewer and will make sure that sentences that end with a formula/equation will have the adequate punctuation

Specific and technical comments:

Most of the comments are relevant and have been used to improve the manuscript, see the annotated version of the manuscript.

In order to answer to the comments L61-64 and L86-88, an effort has been made to clarify what is an intensive properties (with reference ad hoc) and how the represen-

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tativeness parameter is obtained. Therefore the equations has been changed a little (even if the solution is still the same) in the next paragraph. This also answer the comment #2 of the second reviewer.

For the figures we chose not to change the color of the arrows because in order to keep those more visible as the rest of the figures a in tones of grey.

Please also note the supplement to this comment:

<http://www.solid-earth-discuss.net/7/C657/2015/sed-7-C657-2015-supplement.pdf>

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Interactive comment on Solid Earth Discuss., 7, 1077, 2015.