

Interactive comment on “Inner structure of the Puy de Dôme volcano: cross-comparison of geophysical models (ERT, Gravimetry, Muonic Imagery)” by A. Portal et al.

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Reply to anonymous Referee #1:

We thank the referee for the careful reading of this article. We tried to answer all the suggestions/comments and to develop the unclear points. Please find below the detailed answers.

It is helpful if you could show a topographic map of the volcano as well as Fig. 1.

A topographic map has been added on Figure 1.

p.708, l.9-10: The two models shown on figure 3 have an accuracy of 7% for the north-south 10 section and 20% for the east-west model. What accuracy? Does it refer to the spatial resolution or to the measured value itself?

Accuracy refers here to rms error that represents the difference between the measured apparent resistivity and the apparent resistivity calculated for the model. This definition is now given in the text (*see paragraph 3.1*)

p. 709 l. 12-14 The gravity models were obtained using an inversion package, GROWTH2.0, developed by Camacho et al. (2011).

Although there is a description about the errors in the ERT measurements, there seems no corresponding description in this section. I assume there are some errors associated from the measurement itself and the one produced in the process of the inversion.

Please indicate the accuracy of the density values shown in Fig. 4.

The accuracy of the Bouguer anomaly values is around 0.05 mGal. The inversion model from those data has a rms inversion residual of about 0.02 mGal. This information has been added to the text.

p.709, l. 14-15 A dense core is identified under summit area and is probably rooted bellow 500m into the volcano. I cannot see the dense core rooted below 500m in Figure 4. If it is the information from some other reference, please provide it.

The dense core identified in the density model extents from the surface down to a depth of about 200 m. However, it is well known in the interpretation of potential data that the lower boundary of a body is more difficult to constrain than the upper boundary and the edges. We thus meant that the location of the lower boundary of the dense core could be at higher or lower elevation than on the presented model. We have clarified this point in the text.

p.709, l. 16 On both sides of this core, low density structures form a ring-like pattern.

It is not so clear to me which low density region the authors mean: D3 and D5 or inside of them? Please indicate it in the Figure or in the text.

We have modified the Figure 4. The structures that we describe as forming a low density ring-like pattern around the dense core are now clearly indicated on the figure (*see D4, D6 and D8 labels on Figure 4*)

Fig. 5. All the cross sectional images: (a), (b), and (c) look different, and the units for the horizontal axis are also different. Please unify them. If it is difficult, please add some arrows or something that indicates the same position in (a), (b), and (c) so that the readers can compare the anomalies between these panels.

We have labeled more features on the figures and we have standardized the horizontal axes in order to facilitate the comparison of the sections.