

## ***Interactive comment on “Improvement of density models of geological structures by fusion of gravity data and cosmic muon radiographies” by K. Jourde et al.***

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The Authors thank very much Dr. Oleksandr Menshov and GID editor Dr. Lev Eppelbaum for their comments concerning the manuscript entitled “Improvement of density models of geological structures by fusion of gravity data and cosmic muon radiographies”.

We sum up the changes that were made to the first version of the article and attach to this message the article revised version :

Comments from Dr. Oleksandr Menshov :

C66

1. Please, insert brief information where proposed models of the cosmic muon and gravity could be used. What field of geophysics, geology or other? And 2. Please, give more information about studied area, La Soufrière of Guadeloupe volcano.

We changed (l. 131) :

... with examples taken from real field experiments conducted on La Soufrière of Guadeloupe to emphasize the practical interest of combining muon radiographies and gravity measurements. La Soufrière of Guadeloupe is an active volcano located in the Lesser Antilles arc. The last magmatic eruption occurred in 1530 AD when the present lava dome formed, and the last phreatic eruption occurred in 1976. Recent field measurements in its vents (Allard et al. 2014) and sources (Villemant et al. 2014) show a significant regain of activity in the 2006-2012 period. More recently, new vents appeared during our muon tomography experiments. Developing 3D density models of the lava dome is of a prime interest to assess for the structure of the edifice and to better constrain the upper hydrothermal system and its related hazards. The muon tomographies experiments were already described in various articles . . .

3. Page 2, line 135: Please, describe deeper the results of the muon tomography experiments.

We changed (l.135) :

... were explored and are represented on Fig. 1a. The results showed important density heterogeneities in the volcanic dome well correlated with the surface vents positions. The gravimetry survey ...

4. Page 4, line 260-268: I'm not sure that well known Newton law must be presented as a separate chapter.

We believe this separation is necessary for the document readability. Indeed we do not bring original information in this part of the article but we define important notations for the following.

C67

Comments from Dr. Lev Eppelbaum :

1. I would like to ask the authors to add this small paragraph with the aim to underline the exploration perspectives of this method.

We added l.86 the suggested reference.

Please also note the supplement to this comment:

<http://www.geosci-instrum-method-data-syst-discuss.net/5/C66/2015/gid-5-C66-2015-supplement.pdf>

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