

Interactive comment on “The role of Edge-Driven Convection in the generation of volcanism I: a 2D systematic study” by Antonio Manjón-Cabeza Córdoba and Maxim Ballmer

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Antonio Manjón-Cabeza Córdoba and Maxim D. Ballmer, authors of the manuscript “The role of Edge-Driven Convection in the generation of volcanism I: a 2D systematic study”, are grateful for the thorough comments of Dr. Lisa Rummel. All her comments are useful and allow us to greatly improve the quality and content of the manuscript after careful consideration.

Many of the comments of this referee are about details of the approach, and we will

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add more material in the supplementary material to address them. We summarize the main points made by the reviewer below. Concerns by Dr. Rummel are focused mainly on the melting implementation.

Details about the melting implementation can be found in previous work (cited as Ballmer, 2009; Ballmer *et al.*, 2009). But the questions by the referee made us realize that several important details may not be clear to the readers, especially regarding the treatment of melt fraction (F) and the treatment of the three lithologies (DC, EC and Pyroxenite). We extend the explanation concerning these assumptions and add a couple of figures suggested by the reviewer in the supplementary material. We will also improve Figure 2 in the main text as per suggestion of Dr. Rummel.

We would like to finish by thanking Dr. Rummel for her careful reading of our manuscript, and in particular for detecting a great number of typos and small mistakes, which we correct in the final version of the manuscript.

A final reply that addresses all the comments from Dr. Rummel will be submitted along with the final version of the manuscript, which will be likely uploaded in late October or early November 2020.

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