Reviewer 1

- It would be worthy to provide some kind of sensitivity analysis about the impact of subtle changes in density and/or density domains boundaries geometries on the gravity response of the model. Such sensitivity analysis could further support and reinforce your interpretations and conclusions and contribute to reduce the inherent ambiguity of the gravity method.

- You should discuss the causes and/or possible origin of the differences observed between the densities you calculated for each modelled body from P wave velocities and the densities you finally used, which are shown in Table 1. Particularly when considerable differences exist (e.g. Upper Crust North East Adria, Lower Crust Northern Adria) and when opposite tendencies arose (e.g. Lithospheric Mantle Less Dense vs. Lithospheric Mantle More Dense).

- You should also provide possible explanations or at least discuss the fact that very low densities had to be assigned to lower crustal bodies (Lower Crust Europe, Lower Crust Northern Adria) corresponding to some sectors of the European and Adriatic plates, in order to fit observed and calculated gravity anomalies. Mostly, considering that such very low densities are more typical of the upper than of the lower crust.

We thank the reviewer for these suggestions and have added an additional figure to the manuscript and some new paragraphs to address these topics collectively. The new Fig. 9, shows the results of a model that has been run with lower crustal densities indicated from P-wave velocity to density conversions in regions where the misfit between the densities indicated from P-wave velocity and those used in our final model are greatest (Europe and North Adria). The effect that these alterations have on the calculated and residual gravity fields of the model is then addressed in the paragraphs from line 343 – 363. Model sensitivity, the origin of differences between P-wave velocity to density values and modelled values, and causes for the regions of low density lower crust are also discussed.

- Language should be polished. Some sentences are too long. Wording and phrasing should be improved.

We thank the reviewer for the extensively annotated copy of the manuscript that they provided and have implemented all the corrections they have made to the text along with all suggestions on improvement of sentence structure and brevity. Additionally we have also made our own changes to portions of the text in an attempt to further deal with the point raised.

- Please, show in Figure 1a or in a new figure the limits/boundaries of showing the different plates, blocks and terrains, particularly showing the limits of the European and Adriatic plates, the Vosges, Black Forest and Bohemian massifs, the Po and Molasse Basins, the Upper Rhine Graben, the Veneto-Friuli plain, the Ivrea Zone, and Moldanubia and Saxothuringia. Where is the Ligurian Sea located? You should refer to a figure in the Introduction showing the terrains, blocks, plates mentioned in Introduction section.

We thank the reviewer for their helpful suggestions and have altered Figure 1 significantly to incorporate all of the limits and boundaries you have suggested. In addition the labelling of important tectonic features on all other figures has also been edited to include your suggestions. A sentence has also been added to line 38 of the manuscript indicating that the all tectonic features mentioned in the introduction can be seen in Fig. 1a. Figure captions have also been altered to reflect these changes.

- Please, show clearly in a map and in the section presented in figure 3 the location, extension and boundaries of the European and Adriatic plates and the location of Central Alps.

We thank the reviewer for suggesting how to add clarity to the figure and have implemented these changes.

- Line 73 - seismic reflection heights?..what do you mean with heights?..please clarify

We thank the reviewer for pointing out this ambiguous meaning. We have changes the word heights at line 76 to depths, as we are referring the depths below the surface of seismic reflections.

- Line 78 - Please, briefly describe how these authors obtained the LAB (which methodology did they use), as the LAB is one of the sufaces constituting your model.

We thank the author for pointing out this omission and have added that the LAB was obtained by S receiver functions of teleseismic events in the sentence at line 81.

- Line 172 - Do you mean "upper crust" or whole crust?

The sentence was referring to the whole crust and has now been changed to reflect as such at line 170. We thank the reviewer for noting this.

- Line 179-182 You should use a different word. The word "modelled" is confusing, as you previously said that you did not modify layers thicknesses (which were defined from constraining data) during gravity modelling with IGMAS+.
We thank the reviewer for pointing out the confusing wording and have updated the sentences at lines 178-181 to say the word ‘used’ instead of modelled.

-Line 185 – 188 Please, define European Upper crust, Adriatic Upper Crust and Adriatic Sea. Which bodies of the ones listed in Table 1 are supposed to compose them? Does Adriatic Sea correspond to bodies 15 and 17 in Table 1?
We thank the reviewer for pointing out the lack of clarity here and have made a number of changes to rectify this. The upper crust density domains that Europe (domains 7-11) and Adria (domains 14, 15 and 17) are composed of have been added at lines 184 and 185 respectively so that it is clear when viewing either Figure 4 or Table 1. The Adriatic Sea is now labelled in Figure 1a to make clearer where it is on the modelled area.

Line 195 – 196 Why are European and adreatic (Bodies 23 and 24?) average crust densities given different to those in table 1. Please explain.
We thank the reviewer for pointing out the lack of clarity here. The densities given are an average of the density domains that comprise it. This clarification has been added to the text at line 186 and we have added the lower crust density domains that Europe and Adria are composed of at lines 196 and 197 respectively so that it is clear when viewing either Figure 4 or Table 1.

Please, check along the whole paper the use of upper case or lowercase letters in the names of terrains, blocks etc. as Brianconais Terrain, Tauern Window, etc. Actually, you are sometimes using upper case and sometimes lowercase.
We thank the reviewer for bringing this to our attention and have checked the manuscript for mistakes such as this and corrected them all.

localisation or localization?. Please check spelling along the whole manuscript.
We thank the reviewer for noticing this and we have rectified the instances that these occurred.

What indicates the line labelled a-a´?. Please, explain it in Figure 1 and 2 caption.
We thank the review for pointing out this mistake. a-a’ represents the cross section in Fig. 3. and we have updated the figure captions to reflect this.