

After the careful reading of the revised manuscript, the authors have addressed most of the comments raised by the reviewers during the first-round review. However, some issues still remain in this revised version, and they must be considered by the authors for possible publication in *GMD*.

(1) In the response letter, the authors said that the reference topography is now obtained by applying a spatial filtering approach to the detailed topography, in order to ensure the source consistency between the detailed topography and the reference topography. However, while reading the contents of the revised manuscript, it seems that the Earth2014 model is still used to construct the reference topography. I believe the authors have modified the computations by using the new reference topography, but not updated the relevant contents accordingly in the revised manuscript. Some examples of giving me such a feeling are shown as follows.

**Abstract, lines 21-22** (page and line numbers are referred to the clean version of the revised manuscript): “*and then combined with the reference topography model Earth2014 to construct the RTM*”;

**Page 3, lines 84-85**: “*in combination with the Earth2014 spherical harmonic reference topography model*” ;

**2.4 Reference Topography Model.** In this section, the authors gave a brief introduction of the Earth2014 model. However, if the authors used the spatially filtered reference topography, this section makes no sense.

**Page 7, lines 161-162**: “*The residual terrain in the study area is derived from the high-resolution SRTM-GEBCO topographic model and the Earth2014 reference topography*”;

**Page 18, line 380**: “*Earth2014 (<https://ddfe.curtin.edu.au/models/Earth2014>)*”.

(2) The added explanation on the mass center offset correction (MCOC) is clear to me now. However, I do not think it is a good idea to remove the Figure 6 of the original manuscript from the revised manuscript. Instead, the authors should keep it because it can provide a clear vision of explaining this correction. I advise the authors to do some modifications on this figure. For example, the authors can provide two subfigures. One is to describe the RTM without the RET, marking the prism with the upper surface with the height of  $H_A$  and the lower surface with the height of  $H_B$ . The other one is to describe the RTM with the RET, marking the prism with the

upper surface with the height of  $H_C$  and the lower surface with the height of  $H_D$ . Finally, giving an illustration of moving the latter prism (with  $H_C$  and  $H_D$ ) towards the former prism (with  $H_A$  and  $H_B$ ), aiming to make their centers coincide and resulting in a shifted prism with the upper surface with the height of  $H_Q$  and the lower surface with the height of  $H_W$ . The purpose of doing so is to help the readers better understand Equations (9) and (10) in the revised manuscript.

(3) Abstract should be revised in some extents. From my point of view, the mass center offset correction is the main novel point of this work. And thus, it should be highlighted in the abstract.

(4) **Page 2, line 42:** “*Guo et al.,2010*” should be “*Guo et al., 2010*”.

(5) **Page 2, line 48:** “*beyond this degree.(Gruber, 2009).*” should be “*beyond this degree (Gruber, 2009).*”

(6) Equation (2) should be removed as the spherical harmonic topography is not used here.

(7) Figure 3 only gives the example of the RTM for the land area. The one using the RET for the marine area should be added.

(8) The caption of Figure 4 should claim that the RET has been applied over the marine area.

(9) I suggest to replace the variable “ $R$ ” in Equations (3)-(5) by the variable “ $l$ ”. This is because  $R$  usually denotes the mean radius of the Earth, while  $l$  means the Euclidean distance between two points.

(10) **Page 8, line 195:** “*total gravitational anomaly*” should be “*total gravity anomaly*”.

(11) **Page 9, line 207:** “ $\rho_c = 2670 \text{ kg/m}$ ” should be “ $\rho_c = 2670 \text{ kg/m}^3$ ”.

(12) **Page 10, line 236:** “*downward-continuous*” should be “*downward continued*”.

(13) **Table 3:** “[ $-3400\text{m},1600\text{m}$ ]” should be “[ $-3400\text{m},-1600\text{m}$ ]”.

(14) **Table 4:** In the first column of “*variant*”, the last two terms of “*NGS99-(XGM/RTM)*” can be removed. Furthermore, in the case of using the RTM over the entire area (the last row), what about the differences of the results while considering and not considering the MCOC in the marine area?

There may be other typos I did not find out, please correct all typos during the revision.