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Reply on RC1

Markus Antoni

Author comment on "A review of different mascon approaches for regional gravity field modelling since 1968" by Markus Antoni, Hist. Geo Space. Sci. Discuss., https://doi.org/10.5194/hgss-2022-4-AC1, 2022

Dear Reviewer,

thank you very much for your quick and positive feedback about concept and intention, and also the detailed proofreading corrections.

I read the suggested contributions and included them into my article in the section 1 and section 2.3 as follows (Barthelmes [1986] is not using the term mascon for his modelling as far as I could see):

Mass anomalies are sometimes called mascons without using the phrase for the mathematical modelling as well (c.g. Barthelmes1986, p. 35). The focus of this thesis is on the point mass modelling, but it also sketches simple layer potential and discretion of surface elements, and these 3 aspects will be identified as mascon approach in the sense of the following article.

It should be pointed out that the modelling by point masses is applied for example in (Baur 2011) or (Barthelmes 1986, Claessens et al 2001, Lin 2014} without being labelled as mascon approach by the authors, and that in the latter examples also the positions of the masses are estimated for regional studies of the Earth's gravity field. An iterative algorithm is developed and justified via quasi-orthogonality inthe sense of an inner product in (Barthelmes, 1986). To stabilize the optimization process, the possible movement per point mass shall be restricted in depth but also in radial or tangential direction w.r.t. to an initial position.

I applied your "proofreading corrections" 1 to 28 with the exception of No 3 into my new version. In No 3, a removing of the brackets would bring a "negative statement within my explaination" and "stop the reading flow". My new solution is another footnote, which is hopefully ok for you.

I used the LaTeX package "units". Accidetly there were some extra spacings in some brackets, which I corrected. Now the spacing between number and unit should be fine.

I agree, that the number of vertices should be in math mode for consistency and corrected it. In my personal understanding, this should not hold for "asteroid 216" and "Luna 2", as the number is here part of the name...?

Best Regards

Antoni