

Comments:

The authors refined the bathymetry from satellite altimetry based on an improved VGGNet. While this work is motivated, the manuscript suffers some technical problems.

Major comments:

As a start, it is unclear what the motivation for the choice of the machine learning approach used by VGGNet is. Why did the authors not choose another method for comparison in performance, given that they got poor results from this approach? The author's less innovative approach to VGGNet modification is not in line with the "An Improved Method" mentioned in the article.

The overall structure of the manuscript is unclear. The authors presented some details of the deep learning methods in both the introduction and methods. The multibeam-satellite data and satellite altimetry data are not well described, for example, the data coverage both spatially and temporally, and why they are used. Geographic data from different sources should be preprocessed to eliminate the effect of coordinate errors. What is the specific method of interpolation preprocessing in the article? Why was the method selected? The input and output data of the model are not reasonable. The satellite altimetry data should be used as an input parameter, with the true multibeam satellite bathymetry data being the expected result. The model's experimental testing component should be assigned to one of the three datasets, or to the non-training and validation part of the three regions.

The format of the reference is incorrect. In line 130, the authors cite (Charette et al., 2010), but I did not find any correlation between the authors' method and Charette's theory of the volume of the earth. In section 3.1, the original data source references and links are required. In line 278, the [26][29] method of marking the literature does not fulfill the criteria of uniform reference labeling. There were no similar findings between reference [26] and the approach described in this article. In line 333, what are the previous studies mentioned here? The literature and comparative data need to be annotated.

The manuscript is in need of editing by either a technical writer or, at least, someone with a technical background and conversant with native English. There are many instances of using English words that would better describe the situation than those used.

Specific comment:

L29 and L278: Is it RMSE metric improvement or NRMSE?

L182: What is the meaning of the upper mark 40?

Fig.4, Fig.5 and Fig.6: These figures are too tiny to meet GMD's figure content guidelines requirements.