AC: We thank the reviewers for taking time to review this manuscript. Their insightful remarks have helped us to identify parts in the manuscript which needed clarification and certainly allowed us to improve the quality of this paper.

Community Comment#1

Review about the paper

HUST-Grace2024: a new GRACE-only gravity field time series based on more than 20 years satellite geodesy data and a hybrid processing chain

submitted to Earth System Science Data (https://doi.org/10.5194/essd-2024-39)

Authors: Hao Zhou, Lijun Zheng, Yaozong Li, Xiang Guo, Zebing Zhou, and Zhicai Luo

General Remarks:

The improvement relative to official gravity solutions is impressive. The improvement may come from 1) new accelerometer product, 2) new AOD1B product, 3) algorithm in the manuscript. I would like to see how much of the improvement comes from the new products, and how much comes from the algorithm, thus consolidating the contribution of this work. I suggest the authors add such a controlled variable experiment.

AC: We thank the reviewer for their insightful comments, which helped us to identify parts in need of clarification and undoubtedly allowed us to improve the quality of the manuscript. Below is the point-by-point response to the specific remarks. Indeed, as you stress in the comments, HUST-Grace2024 may be benefit from the hybrid processing chain including many refinements mentioned in the paper. In order to make a quantitative assessment for the refinements, we compare

our products with prior version products such as HUST-Grace2020 in both spectral and spatial domain. Please refer to section 3.1.3 in the revised paper.

1. Fig. 8, the HUST result is better over the CSR result globally, with the exception in western Pacific. Is there a reason for this?

AC: Thank you for insightful comments, the reason maybe come from the different choice of ocean tide models. Actually, according to the suggestion from the reviewers, it's more reasonable to compare the temporal noise between different temporal gravity field based on the EWH residual over the open ocean. We have replotted the figure in our revised paper.

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2. Page 13, L18, a typo in 'shown'.

AC: Thank you for insightful comments, we have modified the typo in our revised paper.
