Line 6: Here what are literatures?
Response: 'literatures' in this context means previous studies. We will change it to 'previous studies'.

Line 41: Some altimetry satellite missions consider their GM phase in their start or middle life of satellites, not all end of life.
Response: Thank you for this comment. Your point is very true. We will rephrase the sentence as: The GM phase is usually considered as end-of-life of the satellite though some altimetry missions consider their GM phase in their start or middle life of the satellite.

Line 49: Here should be geoid model instead of geoid.
Response: We will change it as you have mentioned. Thanks very much.

Line 58: Here what are literatures?
Response: 'literatures' in this context means previous studies. We will change it to 'previous studies'.

Section 2: Only GM data of 5 satellite missions are used in the study. Why not use the other satellite altimeter data include ERM data? What errors are corrected in SSHs? How to assess the precision of SSHs? How to distinguish SSHs' frequencies?
Response: It is true that ERM datasets are also useful. However, as already mentioned in the manuscript, gravity field recovery relies more significantly on high spatial resolution data, which is available in GM datasets rather than in ERM datasets. Typical example is the work of Sandwell et al. (2019), the research paper for SIO's gravity field models. Their study entirely used GM datasets from Geosat, ERS-1, Jason-1/2, CryoSat-2 and Saral/AltiKa. They concluded that "originally, Geosat and ERS-1 were the most important altimeters for recovery of the marine gravity field". This means that the contributions from Jason-1/2, CryoSat-2 and Saral/AltiKa supersedes those from Geosat and ERS-1. In fact, their results showed that ERS-1 no longer provides any significant improvement. The implication here is that, if the GM datasets of Geosat and ERS-1 contributed minimally, then we should not expect better from their ERM versions. Therefore, the conclusions from Sandwell et al. (2019) are the main reasons for our use of these 5 satellites.

The errors corrected in SSHs are defined in Section 3.2.3.2 of Along-track Level-2+ (L2P) SLA Product Handbook. When we revise the manuscript, we will include a sentence to that effect in the manuscript. In this study, the precision of the SSHs is viewed from the precision of the DOVs (Table 3). This is because the DOVs are derived directly from the SSHs. In other words, accurate DOV components implies that the SSHs are also accurate. The frequency of the SSHs is 1 Hz as stated in the Along-track Level-2+ (L2P) SLA Product Handbook.

Sandwell DT, Harper H, Tozer B, Smith WHF (2019) Gravity field recovery from geodetic altimeter missions. Adv Space Res. https://doi.org/10.1016/j.asr.2019.09.011

Line 93: What earth gravity field model is used in the MDT model? Not egm08??
Response: According to Knudsen et al. (2022), the earth gravity field model used in the MDT model is XGM2019e.

Knudsen, P., Andersen, O., Maximenko, N., and Hafner, J.: A new combined mean dynamic topography model – DTUUH22MDT, ESA Living Planet Symposium 2022, Bonn, Germany, 2022.

Line 110: What are x and y?
Response: *x* and y refer to the longitude and latitude, respectively. We will modify when revising the manuscript. Thanks very much for drawing this to our attention.

Line 112: How to precisely determine weight?
Response: Firstly, deviations of components of DOV for each satellite are determined relative to EGM2008-derived components of DOV. These deviations are used to compute error standard deviation (which is inversed to get e) for each satellite for each DOV component. Assuming we want to compute the weights needed to fuse ξ, we compute $e = 1/\mathrm{std}(\xi_{satellite} - \xi_{EGM\,2008})$ for a satellite. This is repeated for the remaining four satellites. The calculated e values are then inputted into Eq. 5 to compute the weights needed to arrive at the fused ξ signal.

Note that due to the 66^{o} inclination of the Jason missions, the weight assignment in Eq. 5, and consequently satellite contribution analysis, were conducted within latitudinal bounds of ±60^{o}. Individual satellite DOV components outside of this latitudinal range were fused using data from HY-2A, Saral/AltiKa and Cryosat-2 only. We will modify the manuscript accordingly. Thank you very much for this comment.

Line 119: Why to use 2 degrees?
Response: We used 2 degrees because it provided a good trade-off for computer memory consumption. A smaller value would significantly increase the number of smaller grids which occupied a huge proportion of our computer's memory capacity; whereas a bigger value would also incorporate low accuracy points farther away.

Line 125: How to define the local reference frame in detail? One local reference frame is only used in one small area.
Response: Thank you for this comment. You are right, the reference frame is used in one small local area. The local reference frame is north-oriented (i.e., *x*, *y*, *z*); with *x* referring to the direction along latitude to the north, *y* referring to the direction along longitude to the west, and *z* referring to radial direction to outside of the Earth.

Line 128: Here normal gravity should be normal gravity in geoid.
Response: We will change it. Thank you very much.

Line 143: How to calculate λ? How about λ=0?
Response: Thanks for the comment. When λ=0, we set the value to be very small, such as 1e-6. With $[N, M] = size(\text{Gravity field signal})$, and $(\Delta x, \Delta y)$ being the grid spacings along (x, y) axes, (k_x, k_y) are defined as:

When *M* or *N* is even,

$$k_x = \frac{1}{M \cdot \Delta x}\left(\frac{-M}{2}, \cdots, 0 \cdots, \left(\frac{M}{2} - 1\right)\right)$$
$$k_y = \frac{1}{N \cdot \Delta y}\left(\frac{-N}{2}, \cdots, 0 \cdots, \left(\frac{N}{2} - 1\right)\right)$$

When *M* or *N* is odd,

$$k_x = \frac{1}{M \cdot \Delta x}\left(\frac{-M-1}{2}, \cdots, 0 \cdots, \left(\frac{M-1}{2}\right)\right)$$
$$k_y = \frac{1}{N \cdot \Delta y}\left(\frac{-N-1}{2}, \cdots, 0 \cdots, \left(\frac{N-1}{2}\right)\right)$$

(11): In eq. (9), normal gravity is a function with respective to latitude.
Response: You are right that normal gravity is a function with respective to latitude. This study used the mean value of normal gravity. Thank you for this comment.

Line 159: How about north and east components of DOV?
Response: Yes, this analysis was performed for each of fused north and fused east components of DOV. When revising the manuscript, we will rephrase the wording of the sentence to make it clearer to understand.

Line 165: How to construct the eq.?
Response: The construction of Eq. 15 has been explained in lines 166 to 169. The left-hand-side of the equation is a vector of values of the fused ξ component. The design matrix on the right-hand-side is made up of five column vectors (signifying five satellites), each vector contains values of ξ component from one satellite. The unknown parameters (i.e., a_1, a_2, a_3, a_4, a_5) are solved through least squares to obtain the contribution of each satellite in resolving ξ.

Line 173: Jason GM?
Response: Yes, the two Jason GMs used in this study.

Line 178: What are both weighting approaches?
Response: Here, 'both weighting approaches' refers to the regional and global weight assignments. We will rephrase the sentence.

Line 185: SIO can provide DOV model. But DTU not provide directly DOV model.
Response: You are right. We stated this point clearly in lines 187 to 189. We will remove the words "and DTU (https://ftp.space.dtu.dk/pub/)".

(17): δg is generally for gravity disturbance, not gravity anomaly.
Response: Thank you for this comment. We will change it accordingly.

Line 130: The Laplacian equation only holds true outside the earth.
Response: We agree with you that Laplacian equation only holds true outside the earth. However, this same equation forms the theoretical basis on which the spectral relationships between (ξ, η) and Δg, as well as (ξ, η) and T_{zz} were established in the study of Smith and Sandwell (1997). The derivation of these relationships can be seen in Appendix A of their paper. So, similarly in this paper, the Laplacian equation provides a theoretical check on the accuracy of our results.

Sandwell, D. T. and Smith, W. H. F.: Marine gravity anomaly from Geosat and ERS 1 satellite altimetry, J. Geophys. Res., 102, 10039–10054, https://doi.org/10.1029/96JB03223, 1997.

Line 235: The number of decimal separator may be more.
Response: We will increase the number of decimal places in the next version of the manuscript. Thank you for this comment.

Line 255: How to distinguish wave lengths?
Response: Looking at Figure 9, the coherency curve of the inverted Tzz intersects the 0.5 coherency value at wavelengths of 20 and 345 km.

Figure 1: Here should be GMs.
Response: Thank you for this comment. We will change it accordingly.

Figure 3: The resolution of the figure is low.
Response: We agree that the resolution of the figure is low. Honestly speaking, the resolution of the original figure is still very high. So, we believe this was caused by the image-to-pdf conversion during the submission process. We will definitely provide the original high-resolution figure for publication. Thank you for pointing this out to us.

Figure 5: The resolution of the figure is low.
Response: Again, the explanation to the previous comment applies here too. The original resolution of this figure is also very high. Both figures 3 and 5 were created at 300 dpi.