Reply to Editor

To aid the authors with producing a manuscript revision which will quickly be accepted, I'd like to point out that I found responses to reviewer 1's major concerns 2 and 3 to be insufficient. The goal of GMD is to provide readers with an understanding of *cutting-edge* innovations in geophysics. Evaluating against old/suboptimal implementations of rival schemes is at best not state-of-the-art and at worst misleading. I'm sympathetic with the fact that adding new compression methods would be a lot of work, but I will need to see much better justification for keeping things as-is and/or big changes to the manuscript to feel comfortable publishing this work without including more modern compression methods in the evaluation.

We would like to thank the editor for these comments. We understand the concerns raised and would like to clarify several points. First, we neither use any old or suboptimal implementations of the compression methods applied here. The compression methods used here (ZFP, ZSTD and PCK) are all up to date and widely used by the scientific computing and climate communities. Thus, the results presented here are valid and not misleading. SZ3 and MGARD are not more modern compression methods than the here used compression methods ZFP, PCK and ZSTD.

Second, ZFP has continously undergone further developed since its first release (Lindstrom et al., 2025). ZFP is a very powerful compression method that offers several modes (fixed accuracy, fixed precision, fixed rate and an "expert" mode). Which mode to be used can be chosen by the user and there are, to our knowledge, no studies that state that one of the modes is not suitable or performing less then the other mode. Diffenderfer et al. (2019) provide a detailed error analysis for ZFP, clearly stating that the errors for all modes are similar. The same holds for studies where ZFP was compared with other compression methods as e.g. SZ3. The only study that may indicate that the accuracy mode could perform better than the precision mode, is the study from Tinto Prims et al. (2024). This result can only be inferred by examining their figures. However, the paper does not explicitly disucss which mode performs better. Furthermore, Tinto Prims et al. (2024) do not provide the error bounds, so we cannot repeat their compression test. Additionally, the used ERA5 test data may differ. Each user downloads different subsets of meteorological parameters with different resolutions. Even knowing the error bounds of Tinto Prims et al. (2024), the results would be most probably not comparable.

Third, we would like to emphasize once again that our study does not focus on determining the best compression method for the ERA5 data. Our goal is to rather understand how using compressed data files as input files affect trajectory calculations. Testing all compression methods and set-ups is impossible since there are too many options. Previous studies also selected a limited number of set-ups and methods to test (e.g. Baker et al., 2019; Alfarov et al., 2019; Delaunay et al., 2019; Poppick et al., 2020; Huang and Hoefler, 2023; Baker et al., 2024; Tinto Prims et al., 2024).

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