Review: "The OCEAN ICE mooring compilation: a standardised, pan-Antarctic database of ocean hydrography and current time series"

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Summary

This study presents the first standardized, pan-Antarctic compilation of moored hydrography and current time series, developed through a systematic analysis of historical mooring data from the marginal seas and contributions from international data centers, research institutes, and individual data providers. Spanning over five decades (1970s–2020s), the compilation enables detailed analysis of water mass transport and shelf connectivity across the Antarctic margin. The authors demonstrate the utility of the compilation through spectral analysis, removing dominant tidal signals via multi-linear regression. The detided records, though limited in duration, capture synoptic to seasonal variability, with regional patterns of kinetic energy offering insights for future study.

This dataset is a timely and valuable resource for research along the Antarctic margin, addressing an urgent need for sustained observations in the Southern Ocean. I appreciate the international effort by the group of observational scientists in assembling and standardizing this compilation. I have one major comment regarding Technical Quality, along with several minor comments detailed below. Overall, the manuscript is well written and provides a clear and well-structured contribution to the oceanographic community.

Technical Quality

While the compilation brings together an impressive range of historical mooring records, it remains unclear how the authors address uncertainty and error analysis across the dataset. The manuscript notes that only minimal data cleaning was performed, with bad data identified by flags or unrealistic values replaced by NaNs, and no further interpolation or extrapolation applied. However, individual mooring datasets often include important quality control information, such as standard errors, instrument uncertainties, or confidence flags. A more detailed explanation of whether and how such uncertainty metrics were retained, harmonized, or reas-

sessed would enhance the transparency of the compilation and support its appropriate scientific use, particularly given the analyses of detided variability presented in the study.

Minor comments

- Figure 2: What causes the sharp drop in the black line at low frequencies in Figure 2a? Since this feature is not present in the detided spectra (Figure 2c), it may be related to tidal energy. A brief explanation would help clarify its origin.

- Given the importance of the detided analysis, will the detided time series be made publicly available alongside the original data? It would also be helpful to clarify the sensitivity of the UTide method to record length, particularly in the case of shorter mooring records.

- Lines 189 & 223: The authors define the seasonal band as spanning 80 days to 1.2 years. Would it be more appropriate to refer to this range as "seasonal-to-annual" to better reflect the upper bound?

- I reviewed the dataset and the provided spreadsheet, which includes useful information such as mooring file names, locations, time ranges, and DOI links to the original data sources. To improve usability, I suggest adding a summary document with more detailed metadata, including instrument type, depth ranges, variable definitions and units, quality control flags, and processing history for each record. This additional information would significantly enhance the dataset's clarity and completeness. I also recommend sharing the analysis code used in the study to further support understanding and facilitate broader use of the dataset.