

Second Review: “Southern Ocean deep mixing band emerges from a competition between winter buoyancy loss and upper stratification strength”

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Summary

The authors did a nice work in response to my previous review. I think the manuscript is significantly improved. I have no major issues with their main conclusions. I have however, a few minor comments regarding the work done in this revision, listed below.

Minor comments

- Lines 178–179: “*We expect B_{250}^{Θ} to be positive north of the PF (stabilising effect of temperature) and negative south of it (destabilising effect), while B_{250}^S should be negative north of the SAF and positive south of it.*” I think “positive” and “negative” should be swapped here.
- Figure 7 and line 5: What time period is defined for “late summer”? In Fig. 7, why not compute the terms of B_{250} and B^{CS} during the same time period, such as the cooling season? Otherwise, it needs to justify the meaning/fairness to compute the difference between them ($B_{250} - B^{CS}$).