

Interactive comment on “Seasonal resonance of diurnal coastal trapped waves in the southern Weddell Sea, Antarctica” by Stefanie Semper and Elin Darelius

Anonymous Referee #3

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This paper deals with Diurnal Topographic Waves (DTW) in the Weddell Sea. The paper is motivated by mooring data collected over several decades and these are discussed on the basis of results from an idealized code of Coastally Trapped Waves. In general the paper is well written and should be suited for publication. There are however some points that the authors could consider prior to publication.

For completeness I miss a figure of the mean velocity based on the moorings, could this be added onto one of the figures? This is of relevance for the choice of current profiles across the shelf break, and further a seasonal variability of the current velocities could be discussed in terms of DTWs summer to winter difference.

Specific comments:

C1

Line 12: Use “weak stratification” instead of “low stratification”

Line 72: Change to “(Brink, 2006) to investigate . . .”

312-323: The authors conclude that the summer amplification of the DTWs during austral summer is not explained by wind. Is there a possibility that the opposite could be the case, i.e. that the increased storminess has a destructive effect on the DTWs during the austral winter? Line 54-55: Is there a reference to accompany this sentence?

Fig 1 and Fig 10: There might be some confusion about what is the positive along-slope current direction; in Fig 1 this would be toward the east while in Fig 10 this appear to be toward the west. Any particular reason why not having positive values with the coast to the left in all cases? Line 80-85: More information is needed here, e.g. the calculation of the orientation of beta requires some choice of averaging length scale that needs some motivation.

Figure 4. An alternative way of including the rotational properties of the velocity series could be to plot them as rotational ellipses (major and minor axis), together with as already done different colors for CW and ACW.

Line 167: In most instances the authors use “austral “ winter/summer. Not always . For clarity be sure that this is consistent through the ms.

Line 186-187: “The bathymetry represents an average of six across-slope sections in the area of moorings M1 to M5”. I understand that it is necessary to make some representative bathymetry, but some more details and motivation would be good.

Line 199. What is meant by the M-mooring array?

Figure 8. Legend is not easy to read. In particular I have problem with what is meant by the “ref top” and ref 80. Please clarify this.

Line 247: Maybe change to “.. a 40 km wide current with a westward core velocity of 0.2 m s⁻¹ and . . . “.

C2

Line 263: Change “to coincide with a tidal” to “to coincide with one exact tidal ..”

Fig 5. This figure must be improved and better simplified.

Line 356-358: Somewhat unclear what is meant here. Do you suggest that the semi-diurnal tide is what sets the stratification that provide the conditions for DTW, or is the point that semi-diurnal is major cause for mixing at the shelf break. Since this point is already mentioned in the introduction a possibility is simply to delete it here.

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