

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

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This paper is a comprehensive assessment of the seasonal variability of diurnal tidal currents in the southern Weddell Sea, using data from 29 moorings between 1968 and 2014. While the seasonal variability is known, and has been previously interpreted as response of diurnal tide-forced shelf waves to changing stratification and along-slope current (various papers from the 1980's), the increased data base and interpretation through sensitivity tests on an idealized model (Brink, 2006) makes this a valuable new study.

My specific comments are provided as margin comments and edits on the marked *.tex file. Most of these are relatively minor. Some major comments are as follows:

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1. Lines 43-55, about CTWs, will possibly make no sense to a lot of readers without a dispersion curve to look at. Probably this means adding a simple sketch of one, showing that c_p is always with shallow water on the left (in the Southern Hemisphere), then three cases of c_g (+ve, -ve, and 0 (RF)).

2. Much of the Discussion is actually Introduction (Background) material. Move everything you knew, or should have known, before the study into Introduction. Discussion could keep some implications (regarding sea ice, mixing etc) that depend on the magnitude of the results you have presented, but expectations should be set in Introduction.

3. The discussion of Figure 5 is not very clear. I think the argument you are trying to make is that the “diurnal band” as a whole shows mainly semi-annual, which you ascribe to K1/P1 modulation. Then, K1 (removing P1 influence by inference) is “annual”. But the modulation of the diurnal band at the semi-annual frequency is too large for K1+P1, even without the other tidal lines (e.g., O1) being caught in the definition of “diurnal band”. Some more thought about this, and an improved discussion, would be useful. It is not impossible that currents and stratification add to a semi-annual term in CTW properties.

4) What does it mean to have a wave whose wavelength (~ 1300 km) is an order of magnitude longer than typical along-slope scales of isobath variability?

– Laurie Padman

Please also note the supplement to this comment:

<http://www.ocean-sci-discuss.net/os-2016-36/os-2016-36-RC2-supplement.pdf>

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