Ocean Science
Discussions

Interactive comment on "Flow separation of intermediate water in the lees of sills off Taiwan from seismic observations" *by* Q. S. Tang et al.

Anonymous Referee #1

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This paper presents seismic visualization of strong stratified flows over submarine ridges, which are combined with other observations and model output to learn about the dynamical processes controlling the flows. An important conclusion is that the apparent flow separation persists over several tidal periods, which tends (if true) to support the density-controlled separation hypothesis. Unfortunately, there are no corroborating hydrographic observations of a dense pool to support this, and the discussion necessarily waffles a bit on the firmness of this conclusion. The main support comes from OFES model results, which suggest a pool of water with small density contrast. Did the authors check archived hydrographic data to try and get better support? Such data could also allow water mass identification through T-S properties.

The barotropic tidal current varies tremendously during the ∼1.5 day acquisition time,

and there will almost certainly be baroclinic tidal currents and barotropic/baroclinic mean currents (which might be estimated from the OFES model). Since it is the total current and the shear that will affect the flow and lee wave generation, I believe more should be done to estimate these currents and discuss their effects. One key piece of info that is missing is: what are the mean currents predicted by the OFES model, and how do they compare to the tidal currents? I expect from your discussion that they should be larger than the tidal current.

My only other point is one of clarity; while the writing is clear, the discussion in section 5 is difficult to follow because it's not always clear which reflectors and features you are discussing. It would be useful to help the reader in figs 3 and 4 by drawing an "interpretation" of the interfacial features you describe along with some annotations and/or markers showing interpreted interfaces, water masses, the bottom, and so forth. Also include arrows that indicate flow direction and relative magnitude in each layer. If you do this, you ought to label the discussed features A, B, etc and refer to these labels in your discussion. Because it's an interpretation, it's best done in separate panels (fig 3b, fig 4b) adjacent to the seismic images.

Minor points:

- the things in the seismic images are best referred to as reflectors, not reflections, which is the reflected sound.

In figure 6, it's hard for the reader to align the time with the position along the seismic sections. This could be easily fixed by adding horizontal distance scales that match figs 3 and 4 to the plots.

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