We would like to thank the anonymous reviewer for his/her constructive comments and suggestions that helped us to improve the manuscript.

1. 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.

A: We checked archived hydrographic data of WOD09 according to your nice suggestion. The mean potential density profiles σ_1 and σ_0 across the Hengchun Ridge and Ryukyu Arc were derived, respectively, as the figure shown below. In this study, the separation boundaries are at 900m and 500m, respectively.

Across the Hengchun Ridge, there is a small density contrast of the deep water (>1000m) between South China Sea and Luzon Trough, similar to the results shown by Qu et al (2006)[1]. Such a contrast could be responsible for the density induced separation in the deep ocean.

Situation is opposite across the Ryukyu Arc below 550m depth. The water in the Okinawa Trough is less dense than in the Pacific Ocean. However, because of the large warm eddy in the Pacific Ocean, isopycnals, which could approximate seismic reflectors, are highly depressed (Tang et al, 2014)[2]. This process makes the water of the Okinawa Trough side has higher density water than that of the Pacific Ocean. And thus the density induced separation occurred. Therefore, we can further conjecture that durations of the flow separation are not permanent. Its time scale can be daily to monthly, for example, since the separation can be controlled by local/temporal processes, such as eddies, tides or flows.

In the manuscript, some sentences are added in the middle of last paragraph: "Further, archived hydrographic data of World Ocean Database 2009 (WOD09, www.nodc.noaa.gov) are used to check the possible density contrasts across the sills (see responses to RC C811). Results show that there is a small positive density contrast on Hengchun Trough side but negative on Okinawa Trough side near their separation depths. However, because of the large warm eddy in the Pacific Ocean, the isopycnals, which approximate seismic reflectors (Tang et al., 2014a), could be highly depressed sustaining a reversed density contrast for a certain period of time."

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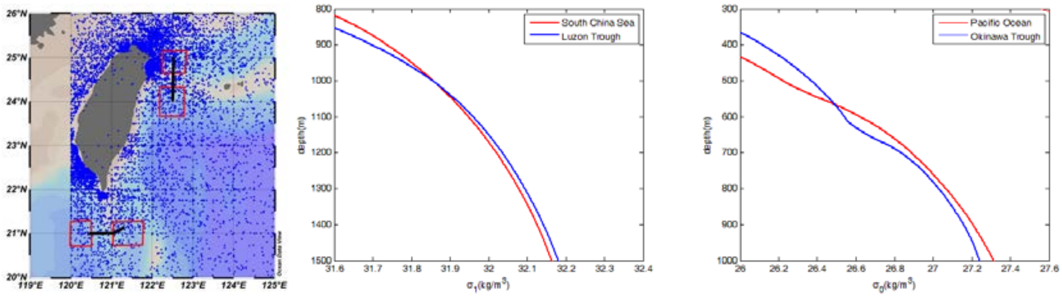
[1] Qu, T. D., Girton, J. B., and Whitehead, J. A.: Deepwater overflow through Luzon Strait, J. Geophys. Res., 111, C01002, doi:10.1029/2005jc003139, 2006.

[2] Tang, Q. S., Gulick, S. P. S., and Sun, L. T.: Seismic observations from a Yakutat eddy in the northern Gulf of Alaska, J. Geophys. Res. Oceans, 119, 3535-3547, doi:10.1002/2014JC009938, 2014.



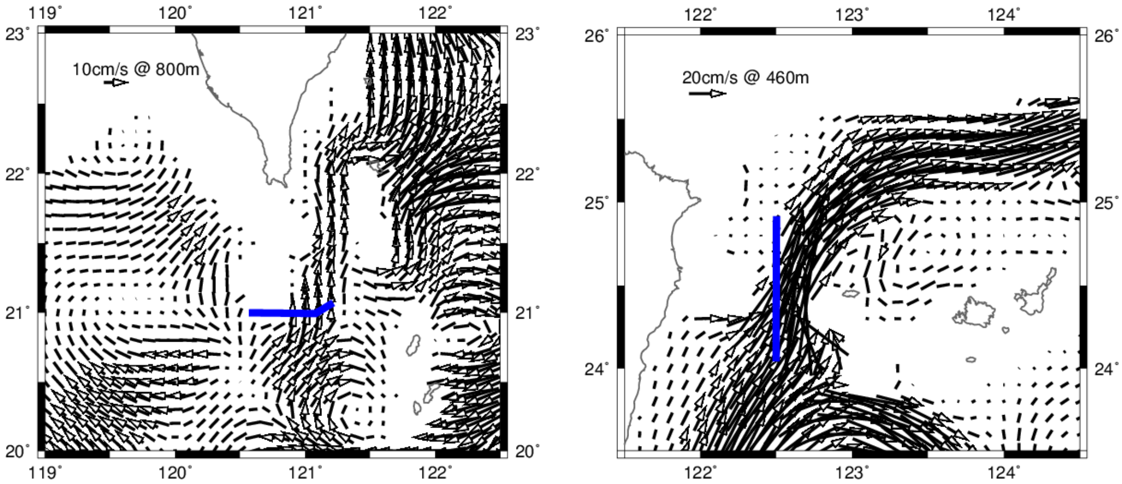
Left: Patches (red) used for deriving mean density profiles; lines (black) are the seismic sections. Middle: σ_1 across the Hengchun Ridge. Right: σ_0 across the Ryukyu Arc.

2. 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.

A: We totally agree with your crucial comment about the mean currents of the study regions should be larger than the tidal currents. At least, they should be comparable or on the same order. Because there was no in-situ data to deconstruct the complex flow components, the model output may be the only choice to support our results qualitatively as you suggested, though its reliability is affected by many factors, such as parameterization, gridding, algorithm, and data assimilation.

The derived current fields from the OFES model of the study regions are shown below. Across Ryukyu Arc, we can see that the mean current is typically 20-50 cm/s. It should be strong enough relative to the north component of the tidal flow to maintain a persistent northward flow. In contrast, east component of the mean current across Hengchun Ridge is around 10 cm/s, ~5 cm/s slower than the peak westward barotropic tidal current as predicted in Figure 6. Considering the baroclinic tidal flow, it might sustain a transient low-speed/near-static current stage of reciprocating flow. This may be another factor which cause the separation point near east Hengchun Ridge is so ambiguous.

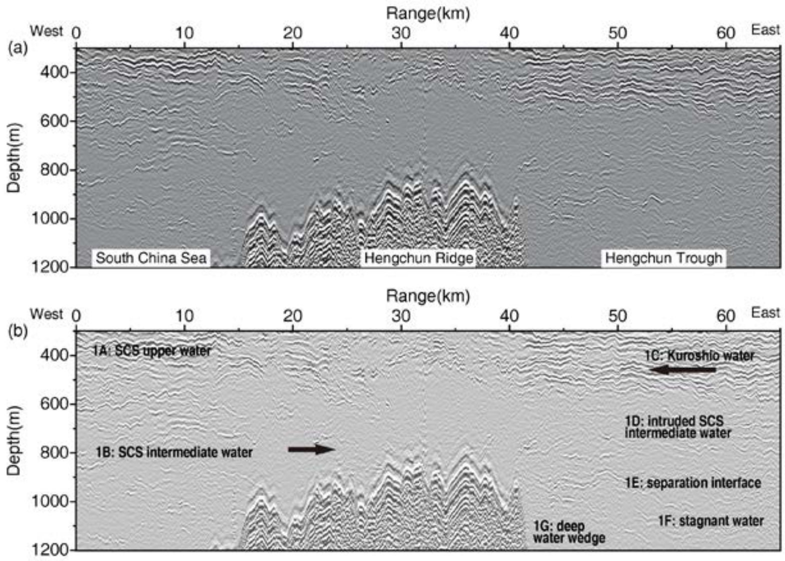
Accordingly, the fourth paragraph of the discussion is revised in the draft: "... Although the barotropic and baroclinic tides were strongly time dependent and varied intensely (Figure 6; Jan et al., 2008), the tidal currents might have not changed the flow directions during those times. Relative to the tidal currents, the mean currents predicted by OFES model also prefer dominant or persistent flow patterns at the separation points (see responses to RC C811). Therefore, it seems that the flow separations occurred under a broad range of current velocities which affect the non-dimensional parameter Nh/U essentially, where the buoyancy frequency N is nearly uniform at the sill crests."



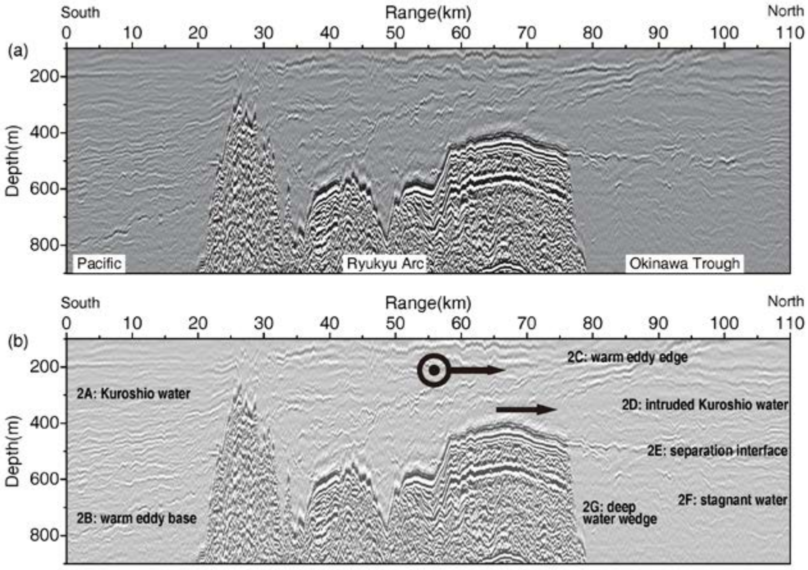
Currents extracted from the OFES model data near Luzon Strait (left) and East Taiwan Channel (right).

3. 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.

A: We added the interpretation panels of seismic sections S01 and S95, respectively, as shown below. These labels have been also clarified in the text.



Seismic section S01 (a) and its interpretation (b).



Seismic section S95 (a) and its interpretation (b).

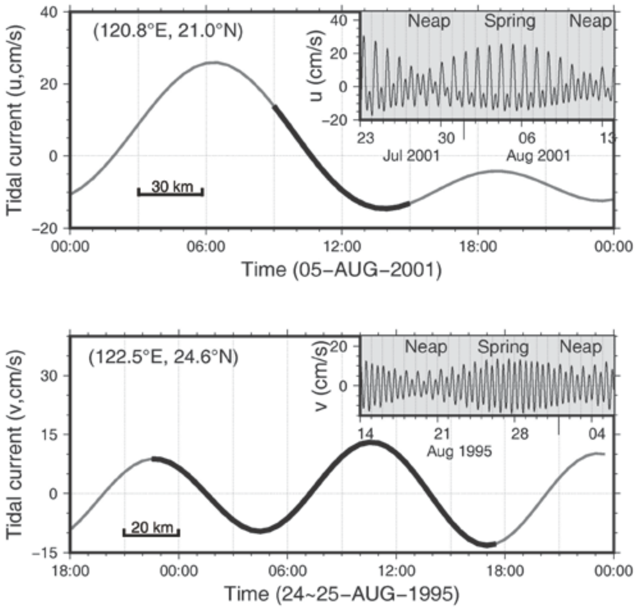
Minor points:

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

A: These are fixed accordingly. Many thanks.

2. 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.

A: Tidal currents in Figure 6 are predicted at fixed locations close to the separation points rather than along the sections. There are approximate but not linear correspondences between time and section distances because of the near-uniform vessel speeds along the sections. Therefore, an approximate distance scale was added in each panel of Figure 6.



Approximate distance scales are added.