

We thank the referee for good comments and suggestions regarding our manuscript.

First, regarding the typos in the text, we will fix all of these in the revised manuscript. Below are responses to more extensive comments and suggestions.

***Line 404: The along-isobath velocity scale  $U$  may be much stronger than the cross-isobath current used in the previous scaling (line 403).***

Good point. The amount of asymmetry between the two velocity components (along and across topography) will depend on both time and length scales of the problem. For high-frequency tidal oscillations the cross-isobath component need not be severely constrained (as it will be e.g. for subinertial, geostrophic flows), but some asymmetry is likely to be found. We will bring this point into the revised text.

***How is the value of  $R$  motivated?***

In the original manuscript we used a literature value for the linear drag coefficient. However, in response to comments from both reviewers, we will update the calculations in the manuscript using an effective linear friction coefficients  $R = Cd*|u|$  instead, where  $Cd$  is the model's quadratic drag coefficient and  $|u|$  is an expected magnitude of current strength. By using the model's actual drag coefficient ( $Cd = 0.0025$ ) and mean values for current strength  $|u|$  (0.29 and 0.23 m/s for Mosken/Værøy and Røst, respectively), we obtain effective linear friction coefficients of values  $R = 8.6 \cdot 10^{-4}$  m/s and  $R = 5.7 \cdot 10^{-4}$  m/s for Mosken/Værøy and Røst, respectively. These are mean values calculated for 5 and 9 closed depth contours between 30 m and 50 m around Mosken/Værøy and between 30 m and 70 m around Røst, respectively.

***Closer to islands,  $D$  decreases. So, how appropriate is a choice  $D=50$ m?***

The slope, where we expect the main vorticity generation to occur, by either mechanism, is mainly located between 30 and 100 m, which can be seen from the bottom contours in Figure 1 below. These depths are therefore the most interesting to investigate regarding vorticity generation and rectification (compare with Fig. 12 of the manuscript). In Figure 1 below, we show a spatial calculation of  $fD/R$ . Here we used an effective linear friction coefficient  $R = Cd*|u|$ , where  $|u|$  is the amplitude of current speed, independent of direction. We see that the  $fD/R$  is mainly between 2 and 4 at the upper slope and more than 10 over the deeper parts of the slope. At very shallow depths near the islands, the bottom friction torque begins to dominate. However, here the slope is gentle, and the vorticity generation is expected to be weak. Therefore, we believe that 50 m is a reasonable choice for the scaling, and that vorticity generation by squeezing and stretching dominates in general around these slopes, and is most interesting to investigate in more detail. But,  $fD/R$  is not much greater than 1 over slopes, hence, we do not believe the bottom friction torque is negligible—as we already state in the manuscript.

We did the same calculations around the same closed contours as mentioned above. Here we got on average value of  $fD/R \sim 6$  around Værøy/Mosken ( $fD/R$  ranging from 5 to 8) and average value of  $fD/R \sim 12$  around Røst ( $fD/R$  ranging from 7-19). We will consider adding this information in the revised manuscript.

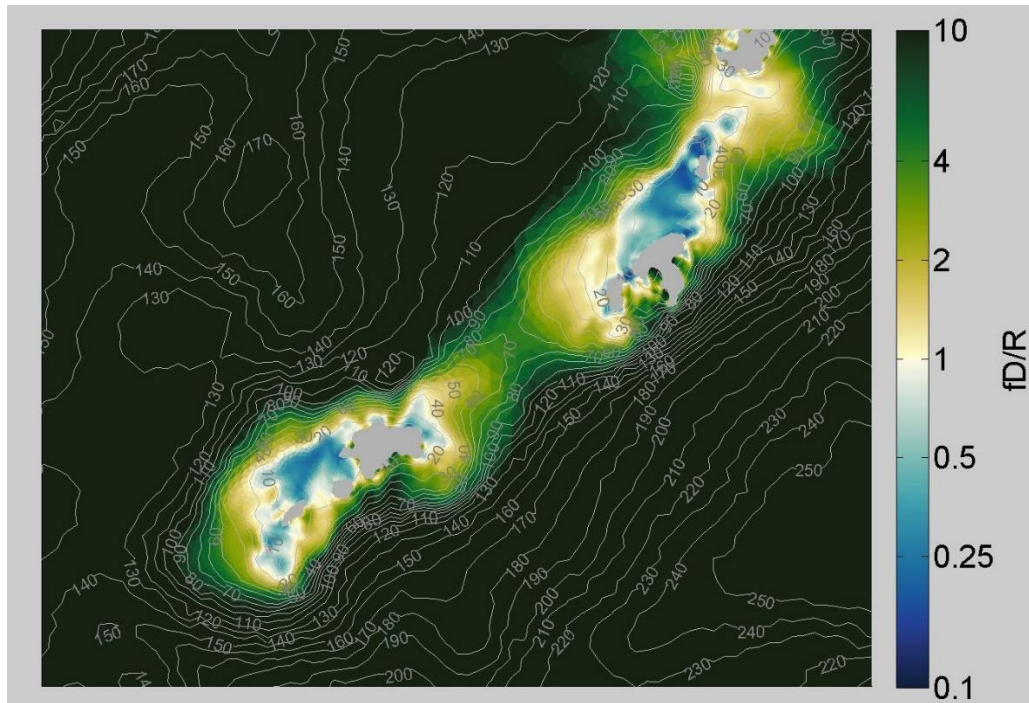


Figure 1  $fD/R$  for the region around Mosken/Værøy and Røst. Here  $R = C_d * |u|$ , and  $|u|$  is the amplitude in current speed, independent of direction. The contours show the bottom topography.

**Line 519: Bottom intensification of tidally rectified flows and concomitant vertical circulation cells (Maas et al 1989) might possibly be of relevance for the transport and spreading of marginally sinking larvae and cod eggs.**

Thank you for the reference. We will include this in the discussion. Another related issue: the prominent tidal motion, particularly in interaction with topography, will also induce strong vertical mixing which may greatly reduce the stratification. So, the amount of bottom intensification is presumably influenced by small-scale mixing processes set up by the same currents that drive the mean flow. As mentioned in the manuscript, we intend to have a look at stratification effects in the 3D follow-up study and assessing bottom intensification would be a natural part of that.

**Figures A1 and A2 have interchanged captions**

Yes, thank you for pointing this out, we will fix this in the revised manuscript.