Ocean Science Discussions

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Reply on RC2

Eli Børve et al.

Author comment on "Rectified tidal transport in Lofoten–Vesterålen, northern Norway" by Eli Børve et al., Ocean Sci. Discuss., https://doi.org/10.5194/os-2021-41-AC3, 2021

Here are some additional comments to the reviewer's question regarding the scaling of the vorticity production terms in Line 404:
"The along-isobath velocity scale U may be much stronger than the cross-isobath current used in the previous scaling (line 403)".

We calculated the along- and cross-isobath velocities (u and v, respectively) around the depth contours encircling the two island groups. Taking the contour-mean amplitude of the two oscillating velocity components, the along-slope velocity component U is only up to 1.6 times the amplitude of the cross-slope velocity component V.

The mean ratio U/V around Røst is 1.4 and around Mosken/Værøy is 1.2. This ratio (U/V) varies off course somewhat around the contours and may be up to almost 3 at some places, which certainly increases importance of the bottom frictional torque. However, the over-all impression, is that a scaling assuming U and V has similar magnitude is a reasonable assumption.

Comparing the U/V ratios with Figure 1 in our previous answer, we still, in general, have a weak dominance of the vorticity generation by squeezing and stretching even if we assume U/V = 1.5.

We will include these results and discuss this more carefully in the revised manuscript.