

Ocean Sci. Discuss., author comment AC3
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Reply on RC3

Ole Anders Nøst and Eli Børve

Author comment on "Flow separation, dipole formation, and water exchange through tidal straits" by Ole Anders Nøst and Eli Børve, Ocean Sci. Discuss.,
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The reviewer has no direct criticism of the scientific content of the manuscript but has some comments/suggestions on the written presentation, topics that could be further illustrated, references to include and cases of realistic configurations that could be explored. We will answer the comments one by one:

Lack of conciseness: When writing the revised manuscript, we will keep this in mind and do our best to be as concise as possible. When it comes to describing the asymmetry leading to exchange (line 18-30), we will consider including an illustrative sketch to make this clearer.

Quoting experimental studies: Thanks for making us aware of the paper by Albagnac et al. We will incorporate this into the overview of the field in the introduction.

Illustration of tidal amplitude: Figure 3 also shows the effect of tidal amplitude. Basically, lower amplitude gives lower velocities resulting in less dipoles being formed. The three examples shown in Figure 4-6 is chosen because they show three typical patterns summarizing what we see in all straits and for both tidal amplitudes used. In our opinion Figure 3 is a good illustration of the effect of tidal amplitude, but we will make sure that this is also clearly stated in the text.

Fig 13 and line 412: This will be corrected in a revised manuscript.

Multitidal forcing and comparison with realistic configurations: Yes, multitidal forcing will impact the water exchange through tidal straits. We do not include this here, but we work on two other manuscripts on tidal straits in a more realistic setting. One of these manuscripts is also submitted to Ocean Science (<https://doi.org/10.5194/os-2021-41>) and considers tidal transports in the Lofoten region in Northern Norway. Here we use a barotropic model of the tides in the regions and study tidal pumping through straits and rectified transports around islands. A third paper presenting a 3D study of the same region is underway. Here we examine the role of tidal transports in a model that also includes atmospheric forcing and river runoff. In this work, we clearly see that multitidal forcing is important.