

Hydrol. Earth Syst. Sci. Discuss., referee comment RC3
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Comment on hess-2021-195

Anonymous Referee #3

Referee comment on "Seasonality of density currents induced by differential cooling" by
Tomy Doda et al., Hydrol. Earth Syst. Sci. Discuss.,
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In this manuscript, the authors use a unique year long time series to estimate the frequency and strength of the thermal siphon in lakes and the influence on flushing of the littoral zone. This is an interesting dataset and addresses an important concept in physical limnology. The writing and presentation are mostly very good. I have a few general comments that I would like to see addressed though:

1. What is the magnitude of the outflow near the study site? Is it important relative to magnitude of the flushing rates?
2. What influence does the three-dimensionality of the littoral zone play? From my understanding, the entire framework here is 2D, but how uniform do you suppose q is across the lake? What are the limits of your results for other lakes in that context? It appears that Rotsee is about 2D as it gets, but is there a littoral zone aspect ratio where this all falls apart?
3. Given the time of year where TS is most prevalent, does this play a role in accelerating autumn turnover?
4. TS is stronger in the summer, but less frequent. As noted, the summer is when this physical process might have the most impact on ecological and biogeochemical processes. Is there a way to compare TS across the months in a more quantitative fashion, for example, the total volume of water flushed in each month?

Figure 3d - the contours on the upper right corner look more like an artefact of the contouring than anything that might possibly be real?

Figure 6 - are you forcing the intercept here? From the equations that seems the case (an intercept of 0), but that doesn't look like the best fit line, at least for (b)