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Interactive comment on "The open boundary equation" *by* D. Diederen et al.

Anonymous Referee #2

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I have read SC C558. I understand that the authors have now used a purely exponential width variation (Fig. 1), that is $B_\infty = 0$. Am I right? I have a number of questions/requests which are all related to the validity of $\zeta_t u_x = u_t \zeta_x$.

The questions/requests regarding the case covered in SC C558 are:

1. How are the bottom panels of Fig. 2 obtained? After all, $u_t\zeta_x/\zeta_t u_x$ depends on time (see bottom panels Fig. 3 and 4).
2. could the authors include plots of $|u_t\zeta_x/\zeta_t u_x - 1|$ and $^{10}\log|u_t\zeta_x/\zeta_t u_x - 1|$ regarding the bottom panels in Fig. 2?
3. Regarding Figs. 3-8, please plot $|u_t\zeta_x/\zeta_t u_x - 1|$ together with $|u_t\zeta_x|$ and $|\zeta_t u_x|$ (use double y axis for this, e.g. Matlab's plotyy). Also plot $^{10}\log|u_t\zeta_x/\zeta_t u_x - 1|$.

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Next, I would like to obtain Figs. 2-11 (with the presentation modifications mentioned above) for the following variants to the case described in SC C558:

1. $b = 25$ km instead of $b = 100$ km,
2. $b = 300$ km instead of $b = 100$ km,
3. $K = 20$ m$^{1/3}$ s^{-1} instead of $K = 45$ m$^{1/3}$ s^{-1},
4. $K = 80$ m$^{1/3}$ s^{-1} instead of $K = 45$ m$^{1/3}$ s^{-1}.

By the way, are the authors able to run their case in SC C558 with *linear* bottom friction (i.e. $W = ru/h$, with r constant)? If so, please do!

Interactive comment on Ocean Sci. Discuss., 12, 925, 2015.