

**Review of “Impact of vertical coordinate systems on simulations of  
barotropic and baroclinic tides in the Yellow Sea” by Chang et al.**

In this study, the authors compare two different MOM6 simulations of the barotropic and baroclinic tidal dynamics in the Yellow Sea. In one simulation, the authors use a zstar vertical coordinate. In the other, the authors use a hybrid vertical coordinate similar to that used in HYCOM. The authors present a number of diagnostics, including biases relative to SST observations and errors relative to the TPXO tidal atlas, and show that the hybrid vertical coordinate generally seems to perform better. Some of the authors arguments are indirect—for example, they argue that the mixing in the hybrid scheme is probably more accurate because it yields a more accurate vertical profile of buoyancy. Observations of everything that they are looking at are, of course, not always available. All in all, I think that this is a well-written and valuable study. I recommend publication after minor revisions. I only came up with a few very minor suggestions for improvement. See below. I do not need to see this paper again unless the editor deems that to be necessary.

**Minor comments**

Line 760—there were 30+ authors on the MacKinnon et al. study. Your reference to this paper in the reference list only lists a few of them. There should be a “...”, “et al.”, “+ 30 more authors”, or some other indicator of this in your reference.

Paragraph centered on lines 85 and 90—could also consider citing Hiron et al. 2025 as a study that examined the effect of the model vertical resolution on the simulation of internal tides. This is another important choice that modelers must make, one that probably impacts the results that you are looking at here.

Line 115—related to the previous note, here you mention that you use 75 levels in this study. This seems reasonable. I could be wrong, but I’m guessing that the comparison between results in different coordinate systems is probably influenced by the number of levels that you choose. Could you add a sentence saying something about this, and/or why you chose 75 levels?

In Section 2.1 you could briefly mention that you are (as far as I can tell) ignoring the self-attraction and loading term. That is probably fine, given the small size of your domain, but worth a brief mention. Especially because you are including the astronomical tidal forcing.

Line 174 and in other places—minor point, but you might want to check whether the journal convention for typing the principal lunar semidiurnal tide is M2 or M<sub>2</sub>. A similar comment applies for the many mentions of K1 (K<sub>1</sub>).