

**Second REVIEW of**  
**" Assessment of the Finite Volume Sea Ice Ocean Model**  
**(FESOM2.0), Part II: Partial bottom cells, embedded sea ice and**  
**vertical mixing library CVMIX" by Scholz et al., 2021.**

In the revised version of the manuscript, the authors made significant progress and carefully addressed most of my questions/comments from the previous review. In particular, they provided some quantitative analysis which is summarized in the Table now. The authors also improved the quality of the Figures and Tables. I am satisfied with most of the replies provided by the Authors and I think that this manuscript can be published in JTECH after addressing a few minor comments which I provide below:

Minor Question:

1. (old question related to the Line 57:

**Former Line 57:** *"implementation of embedded sea ice relies on the zstar vertical-coordinate option in FESOM2 and also on the fact that the sea ice component is called on each time step of the ocean model"*

***We refer here to the time step of the ocean model, not the sub cycled time steps of the sea ice model. The shown model results use the standard EVP method of Hunke and Dukowicz, 1997 using NEVP=150 subcycles. We will consider using a VP solver, but only if we manage to make it as efficient as the EVP solver.***

Ok. If so, I guess:

- a) then that should be mentioned somewhere around line 57.
- b) Are 150 iterations enough? As far as I know, the last tendency is to increase the number of subcycle iterations up to 2000, since "Too small  $N_{EVP}$  may lead to numerical noise (see, e.g., Bouillon et al., [2013](#); Lemieux et al., [2012](#); Losch & Danilov, [2012](#))" <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2018MS001485>.

This should be discussed.

**Line 59:** zstar-> z-star

**Line 153-155 (Former Line 151):**

*"Furthermore, we limited the thickness of the partial bottom cell to be at least half of the full cell layer thickness to reduce the possibility of violating the vertical Courant–Friedrichs–Lewy (CFL) criterion."*

I guess, your explanations should be included into this sentence, somehow. For example, mention that this limitation is for shallow regions only ...

**Former line 265**

Thank you for providing an explanation and, especially, for the volume transport figure. Actually, I like this figure very much and suggest including it into the Supplemental material! The inflow of the warm AW into Arctic Ocean is the key question in Arctic Ocean modeling and this result may be extremely useful for Arctic Ocean modelers.