Comment on gmd-2022-188

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Community comment on "Barotropic tides in MPAS-Ocean (E3SM V2): impact of ice shelf cavities" by Nairita Pal et al., Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2022-188-CC1, 2022

The paper focuses on the impacts of ice shelf cavities on modelling tides, and shows great improvemnts by considering the ice shelf cavities. I think the consideration includes two aspects: (1) open the ice shelf cavities in the model domain (2) add an extra pressure (p^s) term in the momentum equation to represent the weight of the ice-floating shelves. The importance of (1) has been well known in the literature. For example, De Kleermaeker et al., (2017), Wang et al., (2021), and Blakely et al., (2022, cited in the paper) have showed or recognized the importance of (1) in global tidal predictions. However, impact of (2) is less known to my knowledge, and I am curious how much does (2) contribute to these improvements?

De Kleermaeker, S., et al, 2017. Global-to-local scale storm surge modelling on tropical cyclone affected coasts. In: Australasian Coasts & Ports 2017: Working with Nature.

Wang, P., et al. 2021. Evaluation of a global total water level model in the presence of radiational S2 tide. Ocean Modelling, 168.