

***Interactive comment on* “Seasonal variability of radiation tide in Gulf of Riga” by Vilnis Frishfelds et al.**

Anonymous Referee #2

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The paper discusses mechanisms behind the diurnal oscillations in the water level in the Gulf of Riga. This is an important topic in Baltic Sea research. The paper claims that the Helmholtz oscillations, which are normally discussed as the main reason of oscillations in the literature, can not completely explain the observed phenomenon and argue that the tidal components contribute significantly in the oscillations. The authors attempt to use numerical modelling instead of an analytical approach to study the origin of the oscillations.

However, the paper lacks logic in its structure, is written in the inconsistent matter, and is very difficult to read due to the language problems. The research is not scientifically robust, inconclusive and not well described. Therefore, the paper is not recommended for publication in the Ocean Science journal in its current shape.

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Discussion paper



As example of the illogical structure, the authors show the Figure 1 in the introduction as the reason for the presence of the tidal components in the water level variability. However, this figure is based on the modelling results described much later in the paper. Also, the graph shows the observations without long-term variability, but there is no information about how exactly the long-term components were estimated. The article needs to be significantly re-written following the standard logics of a scientific paper so that in the introduction only the previous research on the topic is discussed, then all the methods, techniques and modelling parameters are discussed, followed by the results presented in the results section. At the moment, almost all the parts of the paper are mixed.

The methods should be carefully described in the paper. For example, which modelling parameters were used? How were the long-term components removed? What is the shape of the perturbation introduced in the HBM model? Why was it introduced only at longitude = 11.96? How changing the parameters of the perturbation or their location affect the results?

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