Review of paper ODYN-D-16-00155, «A simple approach to adjust tidal forcing in fjord models”, by K.Hjelmervik et al.

In this study a new method is proposed to improve tidal predictions in fjords by applying corrections to the open boundary conditions. Contrary to more complex and CPU time-consuming data techniques such as data assimilation, the method has the advantage that it is much easier to implement in currently available models. However, after reading the manuscript, I was not really convinced that the proposed method really improves the quality of the predictions. I have also some doubts about the usefulness of the method. Much improvement could be made if more details are provided about the validation and additional simulations are performed. Detailed comments are given below. I can therefore only recommend publication if the authors are prepared to make a major revision.

Major comments

A major shortcoming is that the method for correcting the amplitudes and phases at the open boundaries is based on harmonic data from one station only. In the case of the Oslo fjord there are two stations (Viker and Helgeroa) available. It would be better, in my opinion, to obtain the harmonic corrections from e.g. a least-squares fitting using the data from the two stations.

Not unexpectedly, the method performs well at the Viker station where the corrections have been derived. No validation is given for the other stations. There is therefore no evidence that the proposed method improves model performance further away.

The reason why the Viker station is selected for making the corrections and not the other one (Helgeroa) is unclear to me. To show that model results do not largely depend on data location, an additional simulation should, at least, be performed using corrections from the Helgeroa station and validated for the same stations used in the previous runs.

Additional figures showing differences in amplitudes and phases between the uncorrected and corrected runs, are needed to see the impact of the open boundary corrections on tidal prediction over the whole domain.

The study for the Saltfjord does not seem to be very relevant as no data are available inside the fjord. The only useful information could be to compare the difference between corrected and uncorrected model results inside the fjord.

Contrary to most commonly used tidal models, the ROMS model uses both elevation and current data as open boundary conditions. As no current data are available in this study, a linear dependency (presumably using the equations for a linear surface gravity wave) is taken. This neglects possibly non-linear effects such as stratification, The importance of stratification (inside the domain) is clearly observed in the vertical phase shift for the current as shown in Figure 8. Please comment.

The validation for the currents at the Filtveldt station (Table 4) shows good agreement for the amplitudes. No agreement is found at all for the phases predicted by the uncorrected and corrected runs. Is there an explanation for this ?

Minor comments

1. Figures 2 and 3 are unclear and should be replaced by colored versions.
2. P.3, line 38: as a “nature” type. Please reformulate “nature” into something more understandable for the reader.
3. P.9, line 3: replace “forcin” by “forcing”