

Interactive comment on “Circulation of the Turkish Straits System between 2008–2013 under complete atmospheric forcings” by Ali Aydoğdu et al.

Anonymous Referee #3

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The paper presents a valuable contribution to the understanding of the circulation in the Turkish Straits System, connecting Black Sea and Mediterranean Sea through Bosphorus Strait, Marmara Sea and Dardanelles Strait. In fact, the focus is put on the Marmara Sea circulation and the heat and mass transport through Bosphorus, to a less extent in the Dardanelles Strait. It deals with the physical modeling of the TSS, thus it lies within the scope of Ocean Science.

The Introduction section gives very good overview of the related studies in the region. The used model FESOM is unstructured grid model, set up with 110 vertical levels and horizontal resolution ranging from 65 m in Bosphorus and 150 m in Dardanelles

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to 1.5 km in Marmara Sea and 5 km in the Black Sea. There is a similar study with unstructured grid model for the same region of Stanev et al. 2017, focusing on the Black Sea dynamics.

The numerical simulation covers 6 years with realistic atmosphere forcing and climatological fresh water flux forcing at the open boundary. There is a reference to the initial implementation of Gürses et al. 2016, but the authors might give some details on it.

The results for the water mass structure in Marmara Sea and the straits are in general interesting and worth publishing. However, it is necessary to discuss the result from the validation, showing that the model error increases in time (Table 2). From Figure 7 it is seen the negative trend in the volume temperature and positive for the volume salinity, what could be the reason for this trend?

The section on the sea level and mass transport in the straits is also interesting. Figure 11 does not quite clear show what is the correlation between observations and simulations. There is information on the lower and upper layer velocity, but it is advisable to give more details on the variability of the interface depth. The chapter on Marmara Sea dynamics is well written. Figure 15 and 17 might look better in color as Figure 16.

Some concrete remarks:

- The terms for α and β are thermal expansion and haline contraction coefficients, their values might be also given in the table with parameters.
- The Figure 3 could be also in colors, now it is not very well read.
- Figure 6b shows cooling on the surface at the south end of Bosphorus, is it realistic?
- There is an unfinished sentence with ??????

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