

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

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To correctly reproduce the exchange of water and energy between adjacent seas, there is the need to jointly describe the general circulation at the basin scale and the processes in the straits, detectable at very fine spatial and temporal scales. The paper of Aydoğdu et al. addresses this issue by applying an unstructured numerical model to a unique domain representing the Turkish Strait System, part of the Black Sea and part of the Aegean Sea. Similarly, in Ferrarin et al. 2018, (Ferrarin, C., D. Bellafiore, G. Sannino, M. Bajo, and G. Umgiesser. 2018. Tidal dynamics in the inter-connected Mediterranean, Marmara, Black and Azov seas, Prog. Oceanogr., 161, 102–115, doi:

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10.1016/j.pocean.2018.02.006), with the use of the unstructured SHYFEM model we simulated the tidal propagation and transformation in the system of inter-connected basins formed by the Mediterranean, the Marmara, the Black and the Azov seas.

The numerical model applied by Aydoğdu et al. to the TSS was properly described, even if some additional details about the forcing and boundary conditions are needed.

My major concern with this study is on the capability of the present model application to correctly reproduce the water circulation in the system and the exchange dynamics at the Dardanelles and Bosphorus straits. The authors argue in the abstract and in the results description that the simulation maintains its realism. However, the evidences provided in the paper demonstrate that some numerical model results are unrealistic. In particular:

- The water fluxes presented in the table 4 are about half than what is reported in the literature (Table 5).
- The water fluxes presented in Figure 13 do not reproduce the observed variability and magnitude.
- The thermocline and halocline are generally deeper than what is observed (Figure 9).
- The numerical model seems not able to correctly reproduce the observed sea level differences between Yalova and Sile. The authors should provide statistics (RMSE, BIAS, R2) of the model performance for the water levels.

Concluding, to my opinion, the authors have to provide clear and robust calibration and validation of their numerical model application before inferring on the water circulation of the Turkish Strait System.

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