



Spatial variability of the Black Sea surface temperature from high resolution modeling and satellite measurements

Artem Mizyuk, Maxim Senderov, and Gennady Korotaev

Federal State Budgetary Institution of Science "Marine Hydrophysical Institute RAS", Sevastopol, Russia
(artem.mizyuk@gmail.com)

Large number of numerical ocean models were implemented for the Black Sea basin during last two decades. They reproduce rather similar structure of synoptical variability of the circulation. Since 00-s numerical studies of the mesoscale structure are carried out using high performance computing (HPC). With the growing capacity of computing resources it is now possible to reconstruct the Black Sea currents with spatial resolution of several hundreds meters. However, how realistic these results can be?

In the proposed study an attempt is made to understand which spatial scales are reproduced by ocean model in the Black Sea. Simulations are made using parallel version of NEMO (Nucleus for European Modelling of the Ocean). A two regional configurations with spatial resolutions 5 km and 2.5 km are described. Comparison of the SST from simulations with two spatial resolutions shows rather qualitative difference of the spatial structures.

Results of high resolution simulation are compared also with satellite observations and observation-based products from Copernicus using spatial correlation and spectral analysis. Spatial scales of correlations functions for simulated and observed SST are rather close and differs much from satellite SST reanalysis. Evolution of spectral density for modelled SST and reanalysis showed agreed time periods of small scales intensification. Using of the spectral analysis for satellite measurements is complicated due to gaps.

The research leading to this results has received funding from Russian Science Foundation (project № 15-17-20020)