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**Variability of coastal waters hydrodynamics in the Southern Baltic  
- numerical modelling**

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**Abstract**

A fully three dimensional  $\sigma$  - level model based on the Princeton Ocean Model code was applied to study wind - driven and thermohaline water movements in the Baltic Sea. The model domain comprises the whole Baltic with its main basins: the Gulf of Bothnia, the Gulf of Finland, the Gulf of Riga, the Belt Sea, Kattegat and Skagerrak. At the open boundary in Skagerrak the simplified, radiation type, boundary conditions were applied. Model, with a horizontal resolution of  $\sim 5$  km and with 24  $\sigma$  - levels in vertical, allows to reproduce variability and main features of currents and thermohaline fields.

To demonstrate the utility of the POM code for the Baltic Sea conditions, the model was applied to simulate variability of water circulation as an response of stratified sea waters to atmospheric forcing. Results of numerical simulations were compared with the results of *in situ* measurements in the coastal area at the Polish Baltic coast. It appears from the calculations that the model yields results that share many features in common with a coastal upwelling, a phenomenon, frequently observed in coastal region of the Southern Baltic.