

Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Numerical simulation of impurity propagation in sea channels

DMITRO CHERNIY, Kiev National Taras Shevchenko University, STANISLAV DOVGIY, ALEXANDRE GOURJII, Institute of Hydromechanics, National Academy of Science of Ukraine — Building the dike (2003) in Kerch channel (between Black and Azov seas) from Taman peninsula is an example of technological influence on the fluid flow and hydrological conditions in the channel. Increasing velocity flow by two times in a fairway region results in the appearance dangerous tendencies in hydrology of Kerch channel. A flow near the coastal edges generates large scale vortices, which move along the channel. A shipwreck (November 11, 2007) of tanker “Volganef-139” in Kerch channel resulted in an ecological catastrophe in the indicated region. More than 1300 tons of petroleum appeared on the sea surface. Intensive vortices formed here involve part of the impurity region in own motion. Boundary of the impurity region is deformed, stretched and cover the center part of the channel. The adapted vortex singularity method for the impurity propagation in Kerch channel and analyze of the pollution propagation are the main goal of the report.

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Date submitted: 08 Aug 2009

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