

ICS “INM RAS Baltic Sea” for the marine environment state monitoring

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Abstract

Development of Informational Computational Systems (ICS) for data assimilation procedures is one of multidisciplinary problems. To study and solve these problems one needs to apply modern results from different disciplines and recent developments in mathematical modeling, theory of adjoint equations and optimal control, inverse problems, numerical methods theory, numerical algebra, scientific computing and processing of satellite data.

In this work the results on the ICS development are presented. We discuss practical problems studied by ICS “INM RAS Baltic Sea“. The System includes numerical model of the Baltic Sea thermodynamics, the oil spill model describing the propagation of a slick at the Sea surface (Agoshkov, Aseev et al., 2014) and the optimal ship route calculating block (Agoshkov, Zayachkovsky et al., 2014). The ICS is based on the INMOM numerical model of the Baltic Sea thermodynamics (Zalesny et al., 2013). It is possible to calculate main hydrodynamic parameters (temperature, salinity, velocities, sea level) using user-friendly interface of the ICS. The System includes data assimilation procedures (Agoshkov, Parmuzin et al., 2015) and one can use the block of variation assimilation of the sea surface temperature in order to obtain main hydrodynamic parameters. Main possibilities of the ICS and several numerical experiments are presented in the work.

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References

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