Variational data assimilation system "INM RAS – Black Sea"

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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 and scientific computing.

The problems discussed above are studied in the Institute of Numerical Mathematics of the Russian Academy of Science (INM RAS) in ICS for Personal Computers (PC).

Special problems and questions arise while effective ICS versions for PC are being developed. These problems and questions can be solved with applying modern methods of numerical mathematics and by solving "parallelism problem" using OpenMP technology and special linear algebra packages.

In this work the results on the ICS development for PC-ICS "INM RAS – Black Sea" are presented. In the work the following problems and questions are discussed: practical problems that can be studied by ICS; parallelism problems and their solutions with applying of OpenMP technology and the linear algebra packages used in ICS "INM – Black Sea"; Interface of ICS. The results of ICS "INM RAS – Black Sea" testing are presented. Efficiency of technologies and methods applied are discussed.

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