

INMOST – a software platform for distributed mathematical modelling

**Kirill M. Terekhov¹, Alexander A. Danilov² Ivan V. Kapyrin³
Igor Konshin⁴, Kirill D. Nikitin⁵ and Yuri V. Vassilevski⁶**

¹ INM RAS, 8 Gubkina str, Moscow, 119333, kirill.terehov@gmail.com,
<http://www.inmost.org>

² INM RAS, 8 Gubkina str, Moscow, 119333, a.a.danilov@gmail.com,
<http://dodo.inm.ras.ru/research/ru/people/danilov>

³ INM RAS, 8 Gubkina str, Moscow, 119333, ivan.kapyrin@gmail.com,

⁴ INM RAS, 8 Gubkina str, Moscow, 119333, igor.konshin@gmail.com,

⁵ INM RAS, 8 Gubkina str, Moscow, 119333, nikitin.kira@gmail.com,
<http://dodo.inm.ras.ru/research/ru/people/nikitin>

⁶ INM RAS, 8 Gubkina str, Moscow, 119333, yuri.vassilevski@gmail.com,
<http://dodo.inm.ras.ru/vassilevski/>

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We present the INMOST library [1, 2], a C++ based software platform for parallel mathematical modelling. The platform includes data structures and algorithms for distributed mesh and data representation; automatic differentiation for (block) assembly of residual vector, Jacobian matrix and Hessian tensor; several parallel linear and nonlinear solvers; preliminary framework for multi-physics coupled problems. The platform was extensively used in the development of nonlinear finite volume methods for scalar diffusion and advection-diffusion equations. INMOST is used in software for complex physical models such as geomechanics, oil recovery, hemodynamics, nuclear waste disposal.

REFERENCES

[1] Vassilevski, Yu and Konshin, I and Kopytov, G and Terekhov, K, *INMOST — a software platform and a graphical environment for development of parallel numerical models on general meshes*. (in Russian) Moscow State Univ. Publ., Moscow, 2013.

[2] INMOST project web page: <http://www.inmost.org>.