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**Adaptive and stabilized approximations of finite element method for the evolutionary problems of mechanics, biophysics and guard of environment**

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**Abstract**

The classes of the correctly formulated variational problems of motion of threads of shallow water, acoustic interaction of fluid with elastic bodies and shells, diffusion- advection- reaction of substance in incompressible medium with dominant advection and/or speed of motion of chemical reactions are investigated. The proof and converging charts of method of eventual elements are built for the decision of two- and three-dimensional variational problems, in particular, with the use of Raviart-Thomas approximations. Created a posteriori estimators of errors of FEM's approximations, strategies of h-adaptation of structure of approximations with the set permissible error, compatible stabilized schemes for singularity revolted problems with dominant convection. The object-oriented application packages are developed.