ЛАБОРАТОРИЯ
ИНФОРМАЦИОННЫХ
ТЕХНОЛОГИЙ

СЕМИНАР
по ВЫЧИСЛИТЕЛЬНОЙ
И ПРИКЛАДНОЙ
МАТЕМАТИКЕ

Friday 15 September 2017, at 11.00

Room 310

1. M. B. Yuldasheva, O. I. Yuldashev

Boundary least square method with a 3D high order harmonic basis for solving linear div-curl systems.

For a 3D case justification of the boundary least squares method with a high order harmonic basis which is earlier formulated by authors is offered. For the linear div-curl systems with Dirichlet conditions and also with the mixed boundary conditions the weak formulations in spaces of piecewise–polynomial gradients of harmonic functions are obtained. Properties of bilinear forms and approximating properties of the basis are investigated. *h*- convergence of approximate solutions is proved. In contrast to a primal formulation of discontinuous Galerkin method, in this method the choice of a penalty weigh function is not required.

2. M. B. Yuldasheva, O. I. Yuldashev

Applications of a high order harmonic basis for solving some magnetostatic problems

The aim of this work is investigation of possibilities of using high order harmonic basis for solving some magnetostatic problems. We consider known methods with our basis and the approach, earlier elaborated by the authors. We present numerical results of their comparison when solving a linear problem on sequences of meshes with various parameters *h* and *p*. For a nonlinear problem with respect to two scalar potentials, it is shown that this model, in suggested new weak formulation, keeps the property of monotonicity. By results of this work it is possible to conclude that the harmonic basis gives more exact approximations on adaptive meshes for the considered magnetostatic problems in comparison with the usual approach.