IMPLEMENTATION OF FUNCTIONAL-TYPE A POSTERIORI ERROR ESTIMATES FOR LINEAR PROBLEMS IN SOLID MECHANICS

MAXIM E. FROLOV

Department of Applied Mathematics Peter the Great St.Petersburg Polytechnic University 195251, Polytechnicheskaya ul., 29 Saint-Petersburg, RUSSIA e-mail: frolov me@spbstu.ru

ABSTRACT

In this report, several widely-used statements for mechanics of deformable solids in 2D are discussed. History of developments of the functional approach [1, 2, 3] to a posteriori error estimation, recent results and open problems are considered. Reliability and efficiency of the approach are illustrated by numerical examples [4, 5].

Supported by the Grant of the President of the Russian Federation MD-1071.2017.1.

REFERENCES

- P. Neittaanmäki and S. Repin, Reliable methods for computer simulation error control and a posteriori estimates, Elsevier, Amsterdam, 2004.
- [2] S. Repin, A posteriori estimates for partial differential equations, Radon Series on Computational and Applied Mathematics **4**, de Gruyter, Berlin, 2008.
- [3] O. Mali, P. Neittaanmäki, and S. Repin, Accuracy verification methods. Theory and algorithms, Computational Methods in Applied Sciences **32**, Springer, 2014.
- [4] M. Frolov, O. Chistiakova, A functional-type a posteriori error estimate of approximate solutions for Reissner-Mindlin plates and its implementation. Winter School on Continuous Media Mechanics. IOP Publishing. IOP Conf. Series: Materials Science and Engineering 208, 012043, 2017. doi:10.1088/1757-899X/208/1/012043
- [5] M. Churilova, M. Frolov, Comparison of adaptive algorithms for solving plane problems of classical and Cosserat elasticity. Materials Physics and Mechanics, **32**, No. 3, 370–382, 2017.