ON THE APPLICATION OF I. VEKUA'S METHOD FOR THE GEOMETRICALLY NONLINEAR SPHERICAL SHELLS

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I. Vekua has constructed several versions of the refined linear theory of thin and shallow shells, containing the regular process by means of the method of reduction of three-dimensional problems of elasticity to two-dimensional ones [1]. This method for nonshallow shells in case of geometrical and physical nonlinear theory was generalized by T. Meunargia [2].

In the present paper by means of the I. Vekua method the system of differential equations for the geometrically nonlinear spherical shells is obtained. Using the method of a small parameter and complex variable functions for approximations of order N=1 the complex representations of the general solutions are obtained. Concrete problems are solved.

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References

[1] I.N. Vekua, Shell Theory: General Methods of Construction. Pitman Advanced Publishing Program, Boston-London-Melbourne, 1985.

[2] T.V. Meunargia, On one method of construction of geometrically and physically nonlinear theory of non-shallow shells. Proc. A. Razmadze Math. Inst., 119 (1999), 133-154.