UDC 539.3

Stress-strain State of an Elliptical Cylinder with an Ellipsoidal Bottoms of Dissimilar Materials Based FEM

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The algorithm of calculating the construction in the form of an elliptical cylinder with ellipsoidal bottom of different materials based on the finite element method with the use of scalar and vector fields interpolating movements is described. As part of the sampling using rectangular curved finite elements with eighteen degrees of freedom in the node. Calculations of a circular cylinder with an articulated ellipsoid of rotation the verification of the algorithm and shows its effectiveness.

Key words: articulated shell, scalar interpolation, vector interpolation, rectangular finite element, ellipsoid, cylinder.

References

1. Klochkov J. V., Nikolaev A. P., Kiseleva T. A. Comparison of options interpolations movement as an example of an arbitrary shell in the shape of an ellipsoid. *Vestnik Volgogradskogo Gos. Arch.- Stroit. Univ. Ser. Str-vo i Arhit.* [Bulletin of the Volgograd State Architectural and Building Univ. Ser. The Construction and Arch.], 2011, no. 23(42), pp. 54–59 (in Russian).

2. Nikolaev A. P., Klochkov J. V., Kiselev A. P., Gureeva N. A. *Vektornaja interpoljacija polej peremeshhenij v konechno-jelementnyh raschetah* [Vector interpolation displacement fields in finite-element calculations]. Volgograd, 2012, 264 p. (in Russian).

3. Sedov L. I. *Mekhanika sploshnoi sredy* [Continuum Mechanics]. Moscow, Nauka, 1976, vol. 1, 536 p. (in Russian).

4. Postnov V. A., Harhurim I. J. *Metod konechnykh elementov v raschetakh sudovykh konstruktsii* [The Finite Element Method in the Calculation of Ship Structures]. Leningrad, Sudostroenie, 1974. 344 p. (in Russian).

5. Klochkov J. V., Nikolaev A. P., Kiseleva T. A. Analysis VAT Arbitrary Nonshallow Shell in the Form of the Compensator Using Vector Interpolation of Displacement Fields. *Izvestiya Volgogradskogo Texniheskogo Universiteta* [Proceedings of the Volgograd Technical University]: Interuniversity. Sat Scientific. Art. no. 10 (97) / VolgGTU. Volgograd IUNL VolgGTU, 2012 (Ser. Actual problems of management, computer science and informatics in technical systems. iss. 14), pp. 28–32 (in Russian).