



UDC 532.516:517.958:531.383

The Problem of a Hydroelasticity for a Tube Ring-type a Profile with Elastic, Geometrically Irregular Outer Shell at Pressure Influence

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The mechanical model presented in the form of a tube of ring section, formed by two surfaces of coaxial cylindrical shells cooperating with viscous incompressible liquid is considered. The mathematical model of this system consisting of the differential equations in private derivatives of describing dynamics of viscous incompressible liquid and an elastic ridge shell together with boundary conditions is constructed.

Key words: hydroelasticity, viscous liquid, tube of ring section, geometrically irregular shell.

References

1. Bashta T. M. *Mashinostroitel'naya gidravlika* [Machine-building hydraulics]. Moscow, Mashgiz, 1963, 696 p. (in Russian).
2. Mogilevich L. I., Andrejchenko K. P. *Dinamika giroskopov s tsilindricheskim poplavkovym podvesom* [Dynamics of gyroscopes with cylindrical floating suspension]. Saratov, Saratov Univ. Press, 1987, 160 p. (in Russian).
3. Mogilevich L. I., Popov V. S. *Prikladnaia gidrouprugost' v mashino- i priborostroenii* [Applied hydroelasticity in mechanical engineering and instrument making]. Saratov, 2003, 156 p. (in Russian).
4. Simdyankin A. A. *Kontaktno-silovoe vzaimodeistvie detalei tsilindro-porshnevoi gruppy* [The kontakt-force interaction of details cylindr-piston group]. Saratov, 2003, 144 p. (in Russian).
5. Kondratov D. V., Mogilevich L. I. Mathematical modelling of processes of interaction of two cylindrical environments with the layer of the liquid between them under free leakage conditions of foundation vibration. *Vestnik Saratovskogo gosudarstvennogo tekhnicheskogo universiteta*, 2007, no. 3(26), iss. 1, pp. 22–31 (in Russian).
6. Mogilevich L. I., Popova A. A., Popov V. S. Dynamics's priests of interaction of an elastic cylindrical environment with a laminar stream of a liquid inside of it with reference to pipeline transport. *Nauka i tekhnika transporta*, 2007, no. 2, pp. 64–72 (in Russian).