

Research work of the Department of Theoretical Mechanics named after Professor N.E. Zhukovsky

© P.M. Shkapov, A.Yu. Karpachev

Bauman Moscow State Technical University, Moscow, 105005, Russia

The article provides a brief overview of the scientific work of the Department of Theoretical Mechanics at Bauman Moscow State Technical University in different directions over the past 10-15 years. It shows the relationship of the research to the basic works of the founder of the Department — Professor N.E. Zhukovsky. Employees of the department solved the problems of mathematical modeling, optimization and diagnostics of mechanical and hydro-mechanical systems, the classical problem of the theory of oscillations, rigid body dynamics and hydro, applied hydrodynamic problems of homogeneous and two-phase flow, artificial cavitation problems shock interactions of bodies, taking into account various aspects of dry friction forces, issues of mechanics of walking robots control, actual problems of dynamics and thermoelasticity of thin cutting tools. Research topics have included a number of other areas of research, most of which are part of the work of leading scientific school on the dynamics of mechanical and hydro-mechanical systems, for many years headed by academician Konstantin S. Kolesnikov. In addition to full-time members of the department, part-time and graduate research students are involved in teaching at junior and senior courses. Significant amount of its research implemented in the educational process, are included in the courses and implemented in laboratory devices and equipment for scientific and educational research.

Keywords: *hydrodynamics, water hammer, cavitation, two-phase flow, surface waves, mathematical modeling, oscillations, global optimization.*

Shkapov P.M. (b. 1954) graduated from Bauman Moscow Higher Technical School in 1977. Dr. Sci. (Eng.), Head of the Department of Theoretical Mechanics named after Professor N.E. Zhukovsky at Bauman Moscow State Technical University, a member of the Presidium of the Scientific and Methodological Council on theoretical mechanics at the Ministry of Education and Science of the Russian Federation. Author of more than 100 publications on the dynamics of mechanical and hydro-mechanical systems, mathematical modeling and calculation of cavitation and two-phase flow in piping systems, the optimization and diagnosis of dynamic systems. e-mail: spm@bmstu.ru

Karpachev A. Yu. (b.1955) graduated from Bauman Moscow Higher Technical School in 1978. Ph. D. Author of more than 50 papers in the field of dynamics and strength. e-mail: a-karpachev@mail.ru