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Dynamic impact on a frozen support caused by natural and quasinatural oscillations of an ice plate

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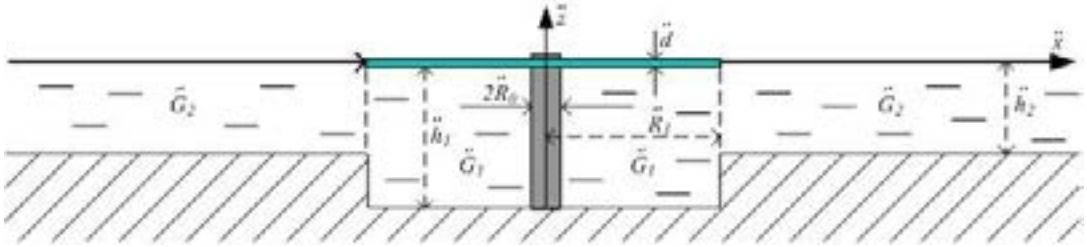
Interest in the problem of ice plate oscillations is due to its wide usage in many practical applications and engineering calculations (design of floating platforms, installation of oil rigs in the polar environment, creation of airfields on ice, etc.). It should be noted that there are projects of giant floating facilities (airports and islands) based on the floating plate concept. The aim of this work is to study the behavior of an elastic plate frozen onto a vertical support and floating on the surface of an ideal incompressible fluid in the case of bounded and unbounded reservoirs and to determine the dynamic loads on the vertical support considering the unevenness of the bottom. The purpose is to consider the asymptotic behavior of natural frequencies with the endlessly increasing reservoir radius and determine the dependence of the natural oscillation frequencies of the plate on the natural oscillation frequencies of the free water surface in a closed reservoir (seiches). Here the natural and quasinatural oscillations of the elastic plate floating on the surface of an ideal incompressible fluid are considered within the linear shallow water theory.



Biography

Aleksei Greshilov graduated from Novosibirsk State University (NSU) in 2012 with a Master's Degree. Currently, he is a Junior Researcher at the Lavrentyev Institute of Hydrodynamics, SB RAS and is working on his PhD thesis on the theme of Polar Mechanics. He has publications in using the theory of long waves in shallow water and the approximation of the Euler beam vibrations was studied of the behavior of thin elastic plates.

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