

# Optimal control of free surface liquid movement

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*The analysis of low perturbed motion of a solid with a cavity containing an ideal fluid with a free surface was done. The assumption is that the liquid free surface insignificantly deviates from the equilibrium one, which permits to transfer conditions to the equilibrium surface. Solution of the problem is presented in the form of a generalized Fourier series whose coefficients are unknown functions of time. For determining these coefficients Cauchy problem was formulated which was solved by the method of successive approximations. We have optimal problem with terminal functional. Using Hamilton—Pontryagin formalism a numerical solution was obtained with integral constraints on the control of the type of inequalities. Numerical tests are presented, and a number of examples are considered.*

**Keywords:** *optimal control, ideal incompressibility liquid, maximum principle, symmetric, asymmetric harmonics.*

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