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Large-time behavior of viscous surface waves. (English) Zbl 0642.76048

Recent topics in nonlinear PDE II, Lect. 2nd Meet., Sendai/Jap. 1984, Lect. Notes Numer. Appl. Anal. 8, 1-14 (1985).

[For the entire collection see [Zbl 0604.00009](#).]

The authors are concerned with global-in-time solutions to a free surface problem for viscous incompressible fluids. The motion in a time-dependent domain $\Omega(t) = \{x \in \mathbb{R}^2 : -b < y < \eta(t, x)\}$ is governed by the Navier-Stokes equations; on the free surface $y = \eta(t, x)$ the usual kinematic and dynamic conditions are assumed, while the velocity of the fluid is assumed to be zero on the fixed lower boundary $y = -b$. Surface tension on $y = \eta(t, x)$ is taken into account. Recently [*Arch. Ration. Mech. Anal.* 84, 307-352 (1984; [Zbl 0545.76029](#))] the first author proved the existence of a global-in-time solution to this problem, assuming that the initial data are near the equilibrium. The aim of this paper is to give the asymptotic decay rate for this problem as $t \rightarrow +\infty$.

MSC:

[76D33](#) Waves for incompressible viscous fluids
[76D05](#) Navier-Stokes equations for incompressible viscous fluids
[35Q30](#) Navier-Stokes equations

Cited in **1** Review
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