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HAMILTONIAN SYSTEMS IN THE THEORY OF SMALL OSCILLATIONS OF A ROTATING IDEAL FLUID. II

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This article describes the behavior of solutions to two-dimensional Hamiltonian systems arising in the theory of small oscillations of a rotating ideal fluid. Representation is established for a class of exact solutions to the linearized Euler equations (the Poincaré–Sobolev system), with the help of which a mathematical model is constructed for the process of origination and development of vortex structures in a cylindric domain.

The second part of the article deals with the peculiarities of fluid oscillations connected with the character of the energy spectrum of a solution. We show that in the case of a continuous spectrum the number of vortex structures increases unboundedly with time while their scale diminishes. Some examples are constructed of exact solutions to the complete Euler system possessing singular continuous energy spectrum.

Key words and phrases: Hamiltonian system, continuous spectrum, vortex structure.

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