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The modeling of the garbage patch formation in the Ocean

A.A. Budnikov (2) and E.V. Stepanova (1)

(1) IPMech RAS, Laboratory of Fluid Mechanics, Moscow, Russian Federation (chakin@ipmnet.ru, +74997399531), (2) M.V. Lomonosov Moscow State University, Physics department, Moscow, Russian Federation

It is well known that the vortex motion in the Atmosphere and Ocean can grab and move objects and various admixtures. The behavior of the trapped objects in dust devils, tornadoes, and other small vortices is sometimes unpredictable. Ocean circulation currents of different sizes, ranging from small vortices to global system of currents stretched all over the oceans, also are capturing and transporting various floating objects. The subject of interest is the marker transport in the flows with a nonuniform distribution of vorticity, which are implemented in a variety of laboratory equipment. A compound vortex is an opportune object to study the admixture transport in the steady reproducible flow. The purpose of this study is to observe the dynamics of floating particles on the surface of the compound vortex, simulating the vortex system with drain in the center and influx of fluid at the periphery. On the liquid surface are placed one or more floating markers.Each new experiment began after the decay of all the visible movements in the pool. The experiments to study the cycle paths of solid markers in a compound vortex are performed at fixed liquid depth and the frequency of rotation and diameter of the disk-activator. All the kinematic parameters of movement are determined and can be reproduced. Some parameters of marker motion as the rate of radial displacement are unpredictable and unstable. The trajectory of the marker depends on its initial position. There is an area on the free surface of compound vortex in which the marker would not move to the center of the rotating surface, and go to the sidewall of the container. The marker has two components of rotation, one around the center of the free surface of liquid, and the other around its own axis. Instantaneous center of rotation of the flow pattern is off-center of symmetry of the container.
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