

### Vortex Arrays Past a Sloping Strip Uniformly Moving in a Homogeneous or Linearly Stratified Fluid

Chashechkin, Y. D.<sup>1)</sup> and Mitkin, V.V.<sup>1)</sup>

1) Laboratory of Fluid Mechanics, Institute for Problems in Mechanics of the RAS, Moscow 117526, prospect Vernadskogo 101/1, Russia

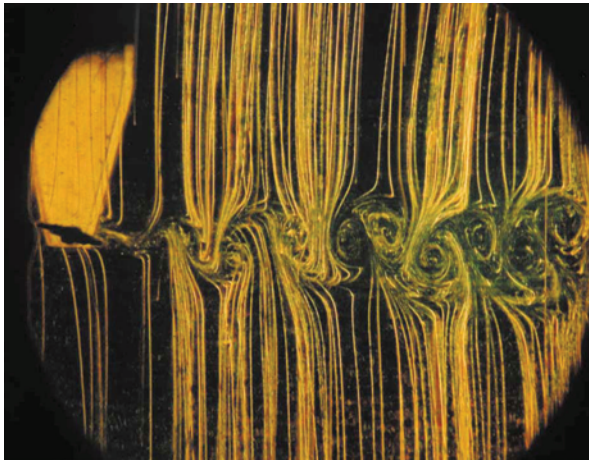


Fig. 1. Homogeneous fluid. Strip is sloped under the angle  $\alpha = 15^\circ$  to horizontal and is towed with velocity  $U = 3.33$  cm/s. Vertical markers are wakes past free descending sugar crystals.



Fig. 2. Weakly stratified brine. Buoyancy period  $T_b = 17.5$  s. Strip is sloped under the angle  $\alpha = 6^\circ$  to horizontal and is towed with velocity  $U = 4.21$  cm/s. The asymmetric laminar vortex array is formed from a wavy near wake.



Fig. 3. Strongly stratified fluid,  $T_b = 7.5$  s. Strip is sloped under the angle  $\alpha = 16^\circ$  to horizontal and is towed with velocity  $U = 4.21$  cm/s. Strong anisotropy of turbulent vortex array is observed. Light and dark strips across the image visualize attached internal waves. Boundaries between light and dark areas near and past the strip are crests and troughs of attached internal waves.

Length of the strip along the ray of view is 39 cm, its width is 2.5 cm and thickness is 0.1 cm. A carriage uniformly moving above the tank tows the strip fixed by two thin transparent vertical supports (knives). Visualization has been performed by Schlieren instrument IAB-458 using Maksoutov's method. Illuminating slit is vertical and Schlieren effect is produced by the vertical thread (diameter 0.16 mm) in the focus.

#### Reference

Chashechkin Y.D., Schlieren Visualization of a Stratified Flow around a Cylinder, Journal of Visualization, 1999, 1-4, 345-354.