FIG. 1(a).

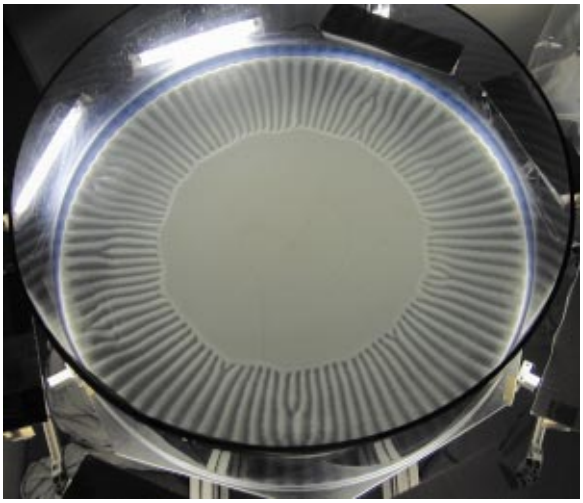

FIG. 1(b).

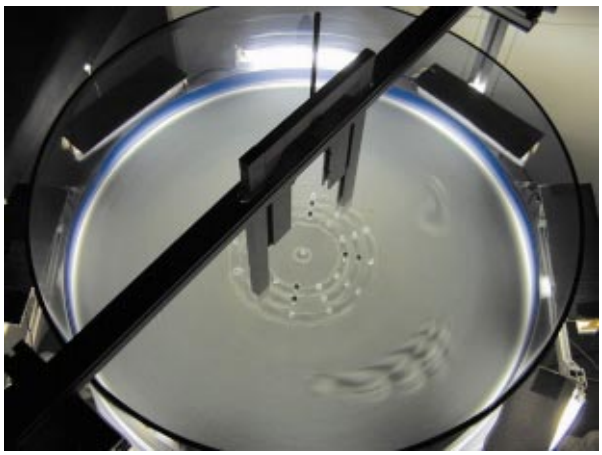

FIG. 2(a).

FIG. 2(b).

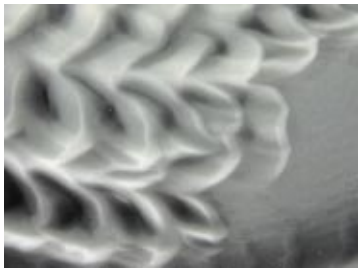

FIG. 2(c).

Sand Ripples in a Rotating Tank

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The generation of ripples on sand dunes and sediment beds by a fluid flow has received a renewed attention recently.[1] Here we study the pattern of sand ripples formed in a circular water tank (90 cm in diameter) in oscillatory (Fig. 1) and continuous (Fig. 2) motion. With an oscillatory shear, the ripples are essentially radial with some defects in the pattern to adjust the wavelength. The ripples start at the periphery of the tank where the shear stress is larger [Fig. 1(b)]. At the beginning of the experiment, there is a coexistence between small amplitude ''rolling grain ripples'' and large amplitude ''vortex ripples'' [Fig. 1(a)].

We also perform continuous shear experiments where the layer of water is confined between the bed of sand, rotating with the tank, and an upper, fixed, Plexiglas plate [Fig. 2(a)]. Small depressions in the otherwise flat bed of sand are used to initiate a system of ripples [Fig. 2(a)]. From the deepest initial depression, a pattern of vortex ripples developed downstream, with a wavelength decreasing in the downstream direction and a segmentation of the ripple pattern in the spanwise direction [Fig. 2(b)]. A detail of the downstream end of the pattern is shown on Fig. 2(c).

[1]See for example, A. Stegner and J. E. Wesfreid, Phys. Rev. E **60**, R3487 (1999); M. A. Scherer, F. Melo, and M. Marder, Phys. Fluids **11**, 58 (1999).