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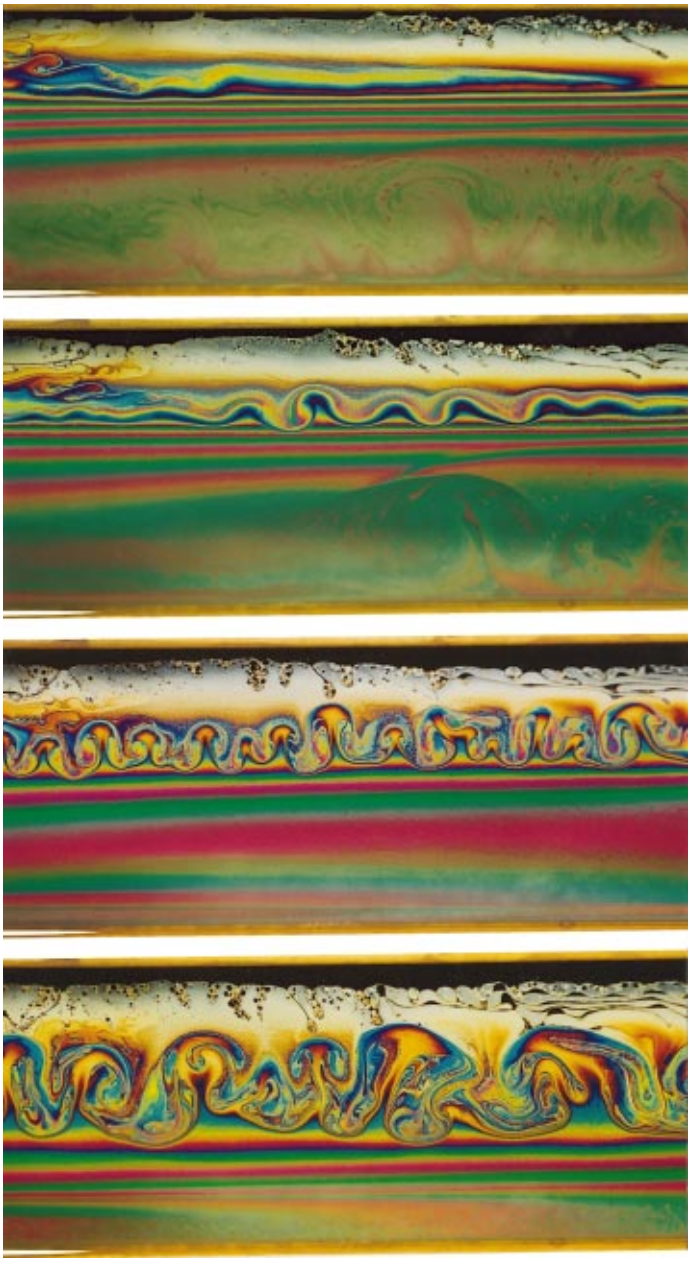

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A soap film was created by dipping a rectangular wire frame of height 3.5 cm and width 15 cm into a solution of 95% by volume distilled water, 4% clear liquid Ivory soap, and 1% glycerine. The frame was mounted in a vertical position, and the film drained under the influence of gravity in an unsaturated environment. Evaporation of water occurs all over the film surface; however, the influence of the associated evaporative cooling is greatest in the thinnest (uppermost) regions of the film. Through amplifying the vertical surface tension gradient, the resulting temperature gradient disrupts the dynamical balance of the draining film and prompts the convective instability captured in this sequence of photographs.

A horizontal bump develops at the base of the gray film and grows in amplitude until becoming gravitationally unstable and so generating a series of sinking plumes of relatively thick film. The plumes penetrate a finite distance into the film, giving rise to a turbulent mixed layer which slowly erodes the underlying region of stably stratified film. The sequence spans approximately 10 s. Note the black film adjoining the wire frame at the top of the film, and the relatively weak convective motions, associated with marginal regeneration, evident near the base of the film.

