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**Rotating flows in an axisymmetric stirred tank.** DANIEL T. VALENTINE, MICHAEL BRAZELL, Clarkson University — Internal flows induced by a rotating disk in a cylinder are described. Axisymmetric flows of incompressible fluids governed by the Navier-Stokes equations were computed. Steady-state solutions and time-periodic solutions were found by solving initial-value problems computationally. Results are presented for steady and periodic motions predicted for a disk-induced flow in a cylindrical container for the range of rotational- Reynolds number from 1000 to 5000. Solutions for one aspect ratio (viz., height-to-radius ratio of 2.0), one disk size (viz., a thin disk with radius equal to 0.5 of the cylinder radius), and one disk location (viz., one quarter of the height of the cylinder from the bottom) are presented. The three- dimensional trajectories for a group of particles were computed. They are presented to illustrate mixing in the stirred tank. The "breakdown" of the primary vortical structure as characterized by breakdown bubbles along the centerline of the upper part of the cylinder are discussed. Side-wall boundary-layer separation and other identifiable flow features that were predicted are also discussed.

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