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Dynamics of a viscous incompressible fluid on the outer surface of a rotating cylinder

We consider a nonlinear fourth-order degenerate parabolic partial differential equation which describes the dynamics of an incompressible thin liquid film on the outer surface of a rotating horizontal cylinder in the presence of gravity. The equation contains two nonnegative parameters proportional to gravity and surface tension respectively. These parameters determine a rich variety of regimes which we analyze analytically and numerically.