Applied Dynamical Systems Seminar

Mr. Ahmad Alhasanat,
Memorial University

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12-1pm, HH-3017

Periodic Steady State Solutions of Liquid Film Flowing Model: Existence and Stability

Abstract:

In this work, we discuss the dynamics of a liquid film flowing over a periodic wavy wall. This study is based on a long-wave model equation valid at near-critical Reynolds number. For periodic and small rate of change of the wall surface, we construct an iteration scheme in terms of an integral form of the steady state problem, and prove its uniform convergence to get the existence, uniqueness, and find formula of periodic solutions. These results can be also obtained by an abstract contraction mapping method. Using Floquet-Bloch theory, we establish the stability/instability of steady state solutions in a weighted functional space. This talk is based on a joint work with Dr. Chunhua Ou.