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Prof. Te-Sheng Lin / Department of Applied Mathematics

Mathematical modeling, Scientific computing, Fluid mechanics, Asymptotic analysis

- The focus of my research is concerned with the development of analytical and computational tools for the problems that arises in fluid dynamics, currently in thin liquid films, and further to communicate with scientists from other disciplines to solve engineering problems in practice.

- My current research topics includes (1) Fingering instabilities in Newtonian films; (2) Modeling and analysis of nematic droplets and films; (3) Coherent structures in non-local dispersive active-dissipative systems; (4) Pulse interaction and bound state formation in electrified falling films. For example, Figures. 1 and 2 present 2D and 3D numerical simulations of fingering instabilities arising in falling liquid films, respectively. Figure 3 presents the pattern formation on a thin film of nematic liquid crystal. Figure 4 shows the simulation that represents a liquid film sheared by a turbulent gas.

Figure 4

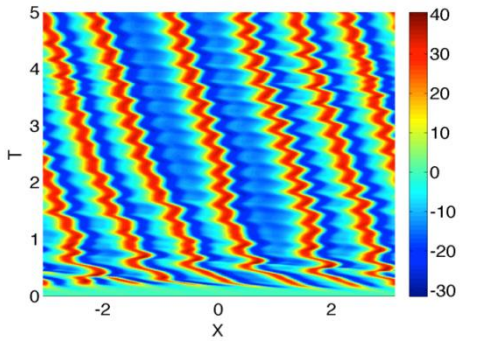

Figure 1

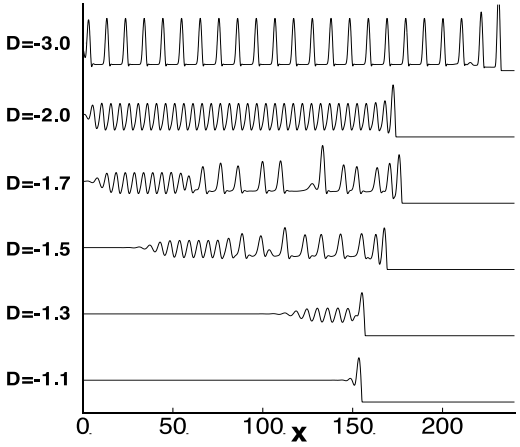

Figure 2

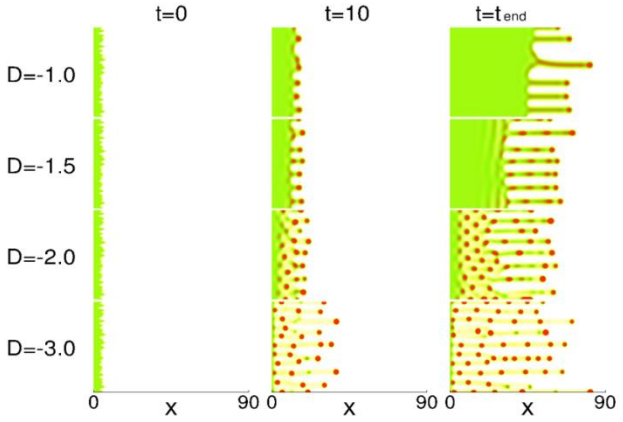

Figure 3