Stability Analysis of Non-Trivial Stationary States of Nonlinear and Non-Local Fokker-Planck Equations

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(based on joint work with Professor G. A. Pavliotis)

Abstract

We study the stability of (non)uniform stationary states of nonlinear and nonlocal Fokker-Planck equations by analyzing the spectral properties of the corresponding linear nonlocal Sturm-Liouville operator. This operator is a bounded perturbation of a linear (local) differential operator, and the nonlocal perturbation is in the form of an integral term. We aim to show that the spectral properties of these nonlocal operators differ considerably from those of their local counterparts.

Keywords

Fokker-Planck equations, nonlinear diffusion, nonlocal interaction, stationary states, stability analysis, spectral theory.