

Analysis and Applied Mathematics Seminar

The Joy of Small Parameters

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Abstract: Many equations that model fluid behavior are derived from systems that encompass multiple physical forces. When the equations are written in non dimensional form appropriate to the physics of the situation, the resulting PDEs often involve multiple non-dimensional parameters. Frequently some of these parameters are very small and they enter into the analysis in different ways. We will discuss one such system which has been proposed as a model for magnetostrophic turbulence and describe results that can be obtained in several different small parameter limits. In this talk we will concentrate on a forced drift-diffusion equation for the temperature where the fluid viscosity enters via the drift velocity. We examine the convergence of solutions in the limit as the viscosity goes to zero. We introduce a natural notion of "vanishing viscosity" weak solutions and prove the existence of a compact global attractor for the critical drift-diffusion equation.

This is joint work with Anthony Suen.

Monday, October 19 at 4:00 PM in Zoom
