Analysis Seminar

Tau Shean Lim

UW-Madison

Traveling Fronts for Reaction-Diffusion Equations with Ignition Reactions and Levy Diffusion Operators

Abstract:

We discuss traveling front solutions $u(t, x) = U(x - ct)$ of reaction-diffusion equations $u_t = Lu + f(u)$ in 1d with ignition reactions $f$ and diffusion operators $L$ generated by symmetric Levy processes $X_t$. Existence and uniqueness of fronts are well-known in the cases of classical diffusion (i.e., when $L$ is the Laplacian) as well as some non-local diffusion operators. We extend these results to general Levy operators, showing that a weak diffusivity in the underlying process - in the sense that the first moment of $X_1$ is finite - gives rise to a unique (up to translation) traveling front. We also prove that our result is sharp, showing that no traveling front exists when the first moment of $X_1$ is infinite.

Host: Andrej Zlatos

Thursday, September 29, 2016
11:00 AM
AP&M 7421