

Large time behavior for time/space nonlocal diffusion equations in \mathbb{R}^N

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Abstract

I will start by revisiting classical results on asymptotic simplification, in particular for the classical heat equation –the best known case.

Then, I will present some results recently obtained for the case in which the classical time derivative is replaced by a fractional one. These are good models for diffusion in materials with memory and/or for diffusion in sticking materials.

Our results are surprising in several ways when compared with the classical ones. These first results correspond to the Cauchy problem –null second member in the equation.

Then, I will discuss the inhomogeneous case both for the fractional time derivative as well as the classical time derivative, as we have obtained surprising new results even in this latter case.

This work has been done in a series of papers in collaboration with Carmen Cortazar from Universidad Catolica de Chile and Fernando Quiros from Universidad Autonoma de Madrid.