

MAXIMUM PRINCIPLES, SLIDING TECHNIQUES AND APPLICATIONS TO NONLOCAL EQUATIONS

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ABSTRACT

This paper is devoted to the study of maximum principles holding for some nonlocal diffusion operators defined in (half-) bounded domains and its applications to obtain qualitative behaviors of solutions of some nonlinear problems. I show that, as in the classical case, the nonlocal diffusion considered satisfies a weak and a strong maximum principle. Uniqueness and monotonicity of solutions of nonlinear equations are therefore expected as in the classical case. I first present a simple proof of this qualitative behavior and the weak/strong maximum principle. A optimal condition to have a strong maximum for operator $\mathcal{M}[u] := J \star u - u$ is also obtained. The proofs of the uniqueness and monotonicity essentially relies on the sliding method and the strong maximum principle.

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2000 *Mathematics Subject Classification.* Primary 35B50, 47G20; Secondary 35J60 .

Key words and phrases. Nonlocal diffusion operators, maximum principles, sliding methods.

The author was supported in part by the Ceremade- Université Paris Dauphine and by the CMM-Universidad de Chile on an Ecos-Conicyt project .