On a class of nonlocal diffusion equations and applications

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Nonlocal reaction-diffusion problems arise in the modeling of natural phenomena. We consider the existence and the approximation, via appropriate reaction-diffusion systems, of solutions to a class of parabolic equations with nonlocal nonlinearities, which in the Lipschitz continuous case are unique. We also give a counter-example to the uniqueness in the case of nonlocal discontinuous reaction term and we give examples of application in mathematical models of combustion theory and of morphogenesis in excitable media.