

# A GLOBAL ATTRACTOR FOR A NONLOCAL PARABOLIC PROBLEM

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In this work we investigate the existence, uniqueness, continuity with respect to the initial values and exponential stability of the weak solutions for a nonlinear parabolic equation of reaction-diffusion nonlocal type by an application of the Faedo-Galerkin approximation and Aubin-Lions compactness result, coupled with some technical ideas. Moreover, we prove the joint continuity of the solution and an important result on the existence of the global attractor is presented.

## References

- [1] A.N. Carvalho. (1995). *Infinite dimensional dynamics described by ordinary differential equations*. J. Differential Equations, 116:338-104.
- [2] J.K. Hale. (1986). *Large diffusivity and asymptotic behavior in parabolic systems*. J. Math. Anal. Appl., 118:455-166.
- [3] J.K. Hale, C. Rocha. (1987). *Varying boundary conditions with large diffusivity*. J. Math. Pures Appl., 66:139-158.
- [4] J.K. Hale, C. Rocha. (1987). *Interaction of diffusion and boundary conditions*. Nonlinear Anal., 11:633-649.
- [5] F.J.S.A. Correa, S.D.B. Menezes, J. Ferreira. (2004). *On a class of problems involving a nonlocal operator*. Applied Mathematics and Computation, 147:475-489.
- [6] M. Chipot, B. Lovat. (1997). *Some remarks on nonlocal elliptic and parabolic problems*. Nonlinear Analysis, Theory, Methods and Applications, 30(7):4619-4627.
- [7] M. Chipot. (2000). *Elements of nonlinear analysis*, Birkhauser Verlag.
- [8] M. Chipot. (2000). *The diffusion of a population partly driven by its preferences*. Arch. Rational Mech. Anal., 155:237-259.
- [9] M. Chipot, J.F. Rodrigues. (1992). *On a class of nonlocal nonlinear problems*. Mathematical Modelling and Numerical Analysis, 26(3):447-468.
- [10] M. Chipot, B. Lovat. (1999). *On the asymptotic behaviour of some nonlocal problems*. Positivity, 3:65-81.

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- [11] M. Chipot, V. Valente, G. Vergara Caffarelli. (2003). *Remarks on a nonlocal problem involving the Dirichlet energy*. Rend. Sem. Mat. Univ. Padova, 110:199-220.