

REACTION-DIFFUSION PROBLEMS WITH CONCENTRATED AND OSCILLATING TERMS ON THE BOUNDARY

MARCONE C. PEREIRA^{*,#}

Abstract

In this talk we analyze the dynamics of the flow generated by a nonlinear parabolic problem when some reaction and potential terms are concentrated in a neighborhood of the boundary. We assume that this neighborhood shrinks to the boundary as a parameter ϵ goes to zero. Also, we suppose that the “inner boundary” of this neighborhood presents a highly oscillatory behavior.

Our main goal here is to show the continuity of the family of attractors with respect to ϵ . Indeed, we use abstract results from [4] to extend results from [2, 3, 1] to a parabolic problem in which the “inner boundary” of ω_ϵ presents a highly oscillatory behavior, and assuming hyperbolicity of the equilibria of the limit problem, we also obtain results on the lower semicontinuity of the attractors.

REFERENCES

- [1] G. S. Aragão, A. L. Pereira and M. C. Pereira, *A nonlinear elliptic problem with terms concentrating in the boundary*, Math. Meth. Appl. Sci. (2012), doi: 10.1002/mma.2525.
- [2] A. Jiménez-Casas and A. Rodríguez-Bernal, *Asymptotic behaviour of a parabolic problem with terms concentrated in the boundary*, Nonlinear Analysis: Theory, Methods & Applications **71** (2009), 2377-2383.
- [3] A. Jiménez-Casas and A. Rodríguez-Bernal, *Singular limit for a nonlinear parabolic equation with terms concentrating on the boundary*, Journal of Mathematical Analysis and Applications **379** (2011), no. 2, 567-588.
- [4] A. L. Pereira and M. C. Pereira, *Continuity of attractors for a reaction-diffusion problem with nonlinear boundary conditions with respect to variations of the domain*, Journal of Differential Equations **239** (2007), 343-370.

MARCONE C. PEREIRA

UNIVERSIDADE DE SÃO PAULO - SÃO PAULO - BRAZIL

E-mail address: `marcone@usp.br`

* Research partially supported by CNPq 302847/2011-1, FAPESP 2008/53094-4 and 2010/18790-0.

Joint work with Gleiciane S. Aragão, Universidade Federal de São Paulo, Diadema, SP, Brazil, e-mail: `gleiciane.aragao@unifesp.br`; and Antônio L. Pereira, Universidade de São Paulo, São Paulo, SP, Brazil, e-mail: `alpereir@ime.usp.br`.