Equation with boundary feedback damping

N1. Author1[1] Ángela Jiménez-Casas, N2. Author2[2,*] Aníbal Rodríguez-Bernal

[1] *Grupo de Dinámica No Lineal Universidad Pontificia Comillas de Madrid C/ Alberto Aguilera 23, 28015 Madrid; ajimenez@comillas.edu*
[2] *Dpto de Análisis Matemático y Matemática Aplicada Universidad Complutense de Madrid. 28040 Madrid and Instituto de Ciencias Matemáticas CSIC-UAM-UC3M-UCM; arober@mat.ucm.es*

Abstract. In this paper we consider PDE problems in which certain terms of the equations are concentrated, when a parameter tends to zero. Usually near the domain boundary.

This implies that the problem in question is subject to singular perturbations that drastically change the nature of the problem, by passing the limit on this parameter. The objective is then to identify the form of the limit problem and to describe the process of convergence of solutions, when this parameter tends to zero. Here we consider a nonlinear PDE problem that is a generalization from previous works such as [1, 2].

Keywords: Transmission problem; Singular limit; Concentrating terms.

Acknowledgments. N1.N2. Partially supported by Projects PID2019-103860GB-I00 and PID2022-137074NB-I00, MINECO, Spain. N1. Partially supported by FIS2016-78883-C2-2-P(AEI/FEDER,U.E.), N2.Partially supported by Severo Ochoa Grant CEX2019-000904-S funded by MCIN/AEI/ 10.13039/501100011033

References

[1] J. M. Arrieta, A. Jiménez-Casas, A. Rodríguez-Bernal (2008). *Nonhomogeneous flux condition as limit of concentrated reactions*. Rev. Iberoam. Matem., 24, 183–211.

[2] A. Jiménez-Casas, A. Rodríguez-Bernal (2020). *PDE problems:with concentrating terms near the boundary*. Communications on Pure and Appl. Anal., 19,4, 2147–2195.