Mathematics > Analysis of PDEs

A nonlinear elliptic problem with terms concentrating in the boundary

Gleiciane S. Aragão, Antônio L. Pereira, Marcone C. Pereira

(Submitted on 31 Mar 2012)

In this paper we investigate the behavior of a family of steady state solutions of a nonlinear reaction diffusion equation when some reaction and potential terms are concentrated in a ϵ-neighborhood of a portion Γ of the boundary. We assume that this ϵ-neighborhood shrinks to Γ as the small parameter ϵ goes to zero. Also, we suppose the upper boundary of this ϵ-strip presents a highly oscillatory behavior. Our main goal here is to show that this family of solutions converges to the solutions of a limit problem, a nonlinear elliptic equation that captures the oscillatory behavior. Indeed, the reaction term and concentrating potential are transformed into a flux condition and a potential on Γ, which depends on the oscillating neighborhood.

Subjects:	**Analysis of PDEs (math.AP)**
MSC classes:	35J91, 34B15, 35J75
Cite as:	**arXiv:1204.0116 [math.AP]**
	(or **arXiv:1204.0116v1 [math.AP]** for this version)

Submission history

From: Marcone Pereira Ph. D. [view email]
[v1] Sat, 31 Mar 2012 17:17:21 GMT (105kb,D)

Which authors of this paper are endorsers?