CONCENTRATION ON CURVES FOR A NEUMANN AMBROSETTI-PRODI TYPE PROBLEM IN TWO-DIMENSIONAL DOMAINS

F. MAHMOUDI (CMM-UNIVERSIDAD DE CHILE)

Abstract. Given a smooth bounded domain $\Omega \subset \mathbb{R}^2$ we consider the problem

$$\begin{cases} -\Delta u = |u|^p - s\,\psi_2 & \text{in } \Omega \\ \dfrac{\partial u}{\partial \nu} = 0 & \text{on } \partial\Omega. \end{cases}$$

where $p > 1$, $s > 0$ is a large parameter, ψ_2 is an eigenfunction of - Δ with Neumann boundary condition corresponding to the second eigenvalue λ_2, and ν denotes the outward normal of $\partial\Omega$. Let Γ be a curve intersecting orthogonally with $\partial\Omega$ at exactly two points and dividing Ω into two parts. Assuming moreover that Γ satisfies a stationary and non-degeneracy conditions with respect to the functional $\int_\Gamma \psi_2^\sigma$, where $\sigma = \frac{p+3}{2p}$, we prove the existence of a solution u_s concentrating along the whole of Γ, exponentially small in s at any positive distance from it, provided that s is large and away from certain critical numbers.