SEMINÁRIO DE EQUAÇÕES DIFERENCIAIS

Asymptotic issues in cylinders

Michel M. Chipot

University of Zurich

13/02/2017 (Segunda-Feira)

16:00 horas

Sala 321 do IMECC

Resumo: We would like to present some results on the asymptotic behaviour of different problems set in cylindrical domains of the type $\ell\omega_1 \times \omega_2$ when $\ell \to \infty$. For $i = 1, 2$ ω_i are two bounded open subsets in $\mathbb{R}^{d_i}$. To fix the ideas on a simple example consider for instance $\omega_1 = \omega_2 = (-1, 1)$ and u_ℓ the solution to

$$\Delta u_\ell = f \quad \text{in} \quad \Omega_\ell = (-\ell, \ell) \times (-1, 2), \quad u_\ell = 0, \quad \text{on} \quad \partial\Omega_\ell.$$

It is more or less clear that, when $\ell \to \infty$, u_ℓ will converge toward u_∞ solution to

$$\Delta u_\infty = f \quad \text{in} \quad \Omega_\infty = (-\infty, \infty) \times (-1, 2), \quad u_\infty = 0, \quad \text{on} \quad \partial\Omega_\infty.$$

However this problem has infinitely many solutions since for every integer k, $exp(k\pi x_1)sin(k\pi x_2)$ is solution of the corresponding homogeneous problem. Our goal is to explain the selection process of the solution for different problems of this type when $\ell \to \infty$.