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SEMINÁRIO DE ANÁLISE E EQUAÇÕES DIFERENCIAIS

Dia 5 de Julho (quinta-feira), às 13h30, na sala 6.2.33

Solutions concentrating on spheres for coupled Schrödinger systems in dimension four

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Abstract:

In this talk, we are concerned with the singularly perturbed coupled Schrödinger system

$$\begin{cases} -\varepsilon^2 \Delta u + \lambda_1 u = \mu_1 u^3 + \beta uv^2 & \text{in } A, \\ -\varepsilon^2 \Delta v + \lambda_2 v = \mu_2 v^3 + \beta vu^2 & \text{in } A, \\ u, v > 0 & \text{in } A, \quad u = v = 0 & \text{on } \partial A, \end{cases} \quad (P_\varepsilon)$$

where $A := \{x \in \mathbb{R}^4 : 0 < a < |x| < b\}$ and $\lambda_1, \lambda_2, \mu_1, \mu_2 > 0$. In dimension four, the Sobolev critical exponent $2^* = 4$. In the cooperative case $\beta > 0$, we prove that there exists some $\beta_0 \in (0, \sqrt{\mu_1 \mu_2})$ such that system (P_ε) admits a vector solution $(u_\varepsilon, v_\varepsilon)$ concentrating on the sphere $|x| = a_\varepsilon$ with $a_\varepsilon \searrow a$ as $\varepsilon \rightarrow 0$ if $0 < \beta < \beta_0$. This talk is based on joint work with João Marcos do Ó.

Seminário financiado por Fundos Nacionais através da FCT – Fundação para a Ciência e a Tecnologia no âmbito do projeto UID/MAT/04561/2013