MULTIPLICITY OF SOLUTIONS FOR SOME ELLIPTIC SYSTEMS

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We consider the problem of existence and multiplicity of solutions for the gradient system

$$\begin{cases} -\Delta u = F_u(x, u, v) & \text{in } \Omega, \\ -\Delta v = F_v(x, u, v) & \text{in } \Omega, \\ u = v = 0 & \text{on } \partial\Omega, \end{cases}$$

where $\Omega \subset \mathbb{R}^N$ is a bounded smooth domain and $N \geq 3$. Under some conditions on the behavior of the function $F \in C^2(\Omega \times \mathbb{R}^2, \mathbb{R})$ near the origin and at the infinity we are able to apply minimax arguments and Morse Theory to prove the existence of two nonzero solutions. The talk is based in a jointly work with Francisco O.V. de Paiva.

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