ON A STRONGLY COUPLED ELLIPTIC SYSTEM WITH HÉNON TYPE WEIGHTS

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Let $B \subset \mathbb{R}^N$ be the open unit ball in $\mathbb{R}^N$ centered at zero, $N \geq 3$, $\alpha, \beta \geq 0$, $p, q > 0$. In this talk we will discuss on the strongly coupled system

$$\begin{cases} -\Delta u = |x|^\beta |v|^{q-1} v, \quad -\Delta v = |x|^\alpha |u|^{p-1} u \quad \text{in} \quad B, \\ u, v > 0 \text{ in } B, \quad u, v = 0 \text{ on } \partial B. \end{cases} \tag{0.1}$$

We will present results on:

1. existence of solutions;

2. multiplicity of solutions;

3. symmetry and symmetry breaking for ground states solutions;

4. a complete picture on the quantitative study of symmetric solutions.

In particular we extend, to the case of the system (0.1), the results in [1, 5, 6, 7, 8] on the Hénon equation

$$-\Delta u = |x|^\alpha |u|^{p-1} u, \quad \text{in} \quad B, \quad u > 0 \quad \text{in} \quad B, \quad u = 0 \quad \text{on} \quad \partial B.$$

The results that will be presented in this talk are mostly contained in [2, 3, 4].

References

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