Research

Analysis Seminar

On multiplicity and concentration behavior of solutions for a critical system with equations in divergence form

Segundo Manuel Argomedo Salirrosas
UnB

Date: October 9, 2020

Time: 10:00 am

Abstract. We consider the system

$$\begin{cases} -\varepsilon^2 \text{div}(a(x)\nabla u) + u = Q_u(u,v) + \frac{1}{2^*}K_u(u,v) \text{ in } \mathbb{R}^N, \\ -\varepsilon^2 \text{div}(b(x)\nabla v) + v = Q_v(u,v) + \frac{1}{2^*}K_v(u,v) \text{ in } \mathbb{R}^N, \\ u,v \in H^1(\mathbb{R}^N), u(x), v(x) > 0 \text{ for each } x \in \mathbb{R}^N, \end{cases}$$

where $2^* = 2N/(N-2)$, $N \geq 3$, $\varepsilon > 0$, a and b are positive continuous potentials, and Q and K are homogeneous function with K having critical growth. We obtain existence of a ground state solution and relate the number of solutions with the topology of the set where the potentials a and b attain their minima. We also show that at the maximum points of each solution, the potentials a and b converge to their points of minima points when ε converges to zero.
Key words: Elliptic critical systems; Schrödinger equation; Ljusternik-Schnirelmann theory; Positive solutions.

References

[1] C. O. Alves *Local Mountain pass for a class of elliptic system*, J. Math. Anal. Appl. **335** (2007), 135-150.