



ANALYSIS SEMINAR

Multiple solutions for a Kirchhoff equation with critical growth

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Date: 26/04/2019
10h30

Auditorium

Abstract. We consider the problem

$$-m \left(\int_{\Omega} |\nabla u|^2 dx \right) \Delta u = \lambda f(x, u) + \mu |u|^{2^*-2} u, \quad x \in \Omega, \quad u \in H_0^1(\Omega),$$

where $\Omega \subset \mathbb{R}^N$, $N \geq 3$, is a bounded smooth domain, $2^* = 2N/(N-2)$, $\lambda, \mu > 0$ and m is an increasing positive function. The function f is odd in the second variable and has superlinear growth. In our first result we obtain, for each $k \in \mathbb{N}$, the existence of k pairs of nonzero solutions for all $\mu > 0$ fixed and λ large. Under weaker assumptions of f , we also obtain a similar result if $N = 3$, $\lambda > 0$ is fixed and μ is close to 0. In the proofs, we apply variational methods.

References

- [1] M.F. Furtado; L.D. Oliveira; J.P.P. da Silva *Multiple solutions for a Kirchhoff equation with critical growth* Zeitschrift für Angewandte Mathematik und Physik 70 (2019), Article 11