



ANALYSIS SEMINAR

The complete bifurcation diagram of a Kirchhoff-type equation

Kaye Silva

Universidade Federal de Goiás

Date: 05/07/2019

10h30

Auditorium

Abstract. Consider the following Kirchhoff-type equation:

$$\begin{cases} - \left(a + \lambda \int |\nabla u|^2 \right) \Delta u = |u|^{\gamma-2} u & \text{in } \Omega, \\ u = 0 & \text{on } \partial\Omega, \end{cases} \quad (\text{K})$$

where $a > 0$, $\lambda > 0$ is a parameter, $\gamma \in (2, 4)$ and $\Omega \subset \mathbb{R}^3$ is a bounded regular domain. We give a description of the bifurcation diagram of (K) with respect to λ , only by using variational methods. In fact, we extend and complete the results of [1] by doing a finer analysis with respect to the Nehari set associated to (K) and proving the existence of a parameter $\lambda^* > 0$ such that: if $\lambda \in (0, \lambda^*)$ problem (K) has at least two non-zero solutions; if $\lambda = \lambda^*$ it has at least one non-zero solution and if $\lambda > \lambda^*$ there is no non-zero solution at all.

References

- [1] Kaye Silva, *The bifurcation diagram of an elliptic Kirchhoff-type equation with respect to the stiffness of the material*, Z. Angew. Math. Phys (To Appear).