SCHRÖDINGER-POISSON SYSTEM WITH ZERO MASS IN $\mathbb{R}^2$ INVOLVING $(2,q)$- LAPLACIAN: EXISTENCE ASYMPTOTIC BEHAVIOR AND REGULARITY OF SOLUTIONS

Edcarlos D. Silva[*]

(UFG - Brasil)

Thursday, February 07, 2024.

16h30 - 17h10

Math Department - Anfiteatro 11

Abstract.

It is stablished the existence of positive least energy solution for the following class of planar ellipitic systems in the zero mass case

$$\begin{cases} -\Delta u - \Delta_q u + \phi|u|^{r-2}u = \lambda|u|^{p-2}u, & \text{in } \mathbb{R}^2, \\ \Delta \phi = 2\pi|u|^r, & \text{in } \mathbb{R}^2, \end{cases}.$$

where $\lambda \leq 0$, $1 < q < 2$, $q^* := 2q/(2-q) < r < \infty$ and $p \geq 2r$. Due to the nature of the problem, we deal with the logarithmic integral kernel. Our approach is based on Nehari manifold and a version of the Principle of Symmetric Criticality due to Palais. Futermore, we study the asymptotic behavior of the solutions wherenever the parameter λ goes to zero or infinity. Finally, we study regularity of the solutions applying Moser interation scheme.

This is a join work with J. C. Albuquerque - UFPE and J. Carvalho - UFS.

[*]Universidade Federal de Goiás, IME, Goiânia-GO, Brazil, edcarlos@ufg.br