A class of semilinear elliptic system with Steklov-Neumann boundary condition[*]

J. D. B. de Godoi[†], **O. H. Miyagaki**[‡], R. S. Rodrigues[§]

We consider the following nonlinear elliptic system involving Steklov-Neumann boundary condition

$$\begin{cases} -\Delta U + C(x)U &= f(x,U), \quad \text{in} \quad x \in \Omega \\ \dfrac{\partial U}{\partial \eta} &= g(x,U), \quad \text{on} \quad x \in \partial\Omega, \end{cases}$$

where $\Omega \subset \mathbb{R}^N, N \geq 2$, is a bounded smooth domain, $C(x)$ is a positive definite matrix, f and g are regular function. We obtain existence results, in the nonresonant cases, more exactly, when f and g interact with the spectrum of the Steklov and Neumann, respectively. Our method of proof is variational and relies mainly on minimax methods in Rabinowitz critical point theory.

[†]Faculdades Integradas de Cacoal, UNESC 76965-864 - Cacoal (RO), Brazil, e-mail: jdamiao7@yahoo.com.br

[‡]Departamento de Matemática, Universidade Federal de Juiz de Fora, 36036-330 - Juiz de fora (MG), Brazil, e-mail: ohmiyagaki@gmail.com

[§]Departamento de Matemática, Universidade Federal de São Carlos, 13565-905 - São Carlos (SP), Brazil, e-mail: rodrigosrodrigues@ig.com.br