



SEMINÁRIO DE EQUAÇÕES DIFERENCIAIS

Systems under superlinear assumption just in some part of the domain

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Resumo: Using a priori bound techniques we study existence of positive solutions of the elliptic system:

$$\begin{cases} -\operatorname{div}(|x|^{\alpha_1} \nabla u) = |x|^{\beta_1} f(|x|, u, v) & x \in B, \\ -\operatorname{div}(|x|^{\alpha_2} \nabla v) = |x|^{\beta_2} g(|x|, u, v) & x \in B, \\ u(x) = 0 = v(x), & x \in \partial B. \end{cases}$$

where B is the unitary ball centered at the origin. Assuming that f, g are nonnegative nonlinearities and that $f(|x|, u, v) + g(|x|, u, v)$ is superlinear at 0 and at ∞ we establish some results of existence of one positive solution. As an application we establish two positive solutions for some non-homogeneous elliptic system. The main novelties here are that the

nonlinearities could have growth from above the critical hyperbole on some part of the domain as well as the local superlinear hypotheses at ∞ . The study of existence of solutions of the non-linear elliptic systems has been of great interest in recent years. For this type of result see, among others, [1, 3, 4, 6, 7, 8] and the survey papers [5, 2]. This is joint work with M.A. Souto(UFCG) and P. Cerda(USACH).

References

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- [3] Ph. Clément, D.G. de Figueiredo and E. Mitidieri. Positive solutions of semilinear elliptic systems. *Comm. Partial Differential Equations*, 17 (1992), 923-940.
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