

SEMINÁRIO DE ANÁLISE

Multiplicity results for asymmetric semilinear problems**Adilson E. Presoto**

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Abstract. We are here concerned with the critical semilinear elliptic problem

$$\begin{cases} -\Delta u = -\mu|u|^{q-2}u + \lambda u + u_+^{2^*-1} & \text{in } \Omega, \\ u = 0 & \text{on } \partial\Omega, \end{cases} \quad (1)$$

where $\Omega \subseteq \mathbb{R}^N$ is a smooth bounded domain, $\mu > 0$, $1 < q < 2$, $2^* = 2N/(N-2)$, and λ is a real parameter. Since the problem (1) has appeared previously in the works [1, 2, 3, 6], and many others have investigated it in different situations.

The above problem combine three well-known works. The study of the interaction of concave and convex terms by Ambrosetti, Brezis and Cerami in [1]; the Brezis-Nirenberg problem [2], where the lack of convergence of (PS)-sequences is contoured by perturbing the nonlinearity via a linear term; and the so-called asymmetric problem, for which the nonlinearity has a different behaviour at plus infinity and at minus infinity, as treated in De Figueiredo and Young [3], and the Ruf and Srikanth [6]. We provide new contributions to the problem above by either allowing λ to lie between two consecutive eigenvalues of the Laplacian operator or even to be an eigenvalue for μ small enough. The main results are contained in the references [4, 5].

References

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