On a class of elliptic problems with indefinite nonlinearities

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In this talk we present results on the existence and multiplicity of positive solutions, depending on a parameter, for a class of indefinite semilinear elliptic problems. Our first result establishes the existence of a positive solution, when the parameter is positive and sufficiently small, without imposing any growth restriction at infinity on the term which depends on this parameter. For proving that, first we find, via an auxiliary result, a positive supersolution for our problem. Then we use a truncation argument and a global minimization method to conclude that our indefinite problem has a positive solution. In our results on the existence of two positive solutions we suppose that the term depending on the parameter has a linear growth at infinity and that the indefinite term is such that the weight function has a thick zero set and the superlinear term satisfies the Ambrosetti-Rabinowitz condition. The results are derived, via minimax methods, after verifying that the associated energy functional satisfies the Palais-Smale compactness for appropriate values of the parameter. In the talk we also present other results for related indefinite problems. These results are in collaboration with Everaldo Medeiros and Uberlandio Severo.

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