Editorial

Sign-Changing Solutions to Equations of Elliptic Type

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The equation of elliptic type is one of the most important equations which is closely related to the real world. The studies of the existence of solutions for elliptic problems under various boundary conditions have received much attention over the last decades. Among them, the number of solutions, the geometrical and topological properties for those solutions are essentially the subject matter on this line. In the recent years, there has been an increasing interest to develop a theory by which one can obtain much more information on the solutions. In particular, the nodal properties of solutions to elliptic equations are becoming increasing popular. The central theme of the current special issue is about the sign-changing solutions to equations of elliptic type.

The first paper of this special issue addresses the multiplicity result for antisymmetric sign changing solutions of an elliptic equations defined on a smooth compact-connected Riemannian manifold without boundary and with dimension greater than one. They obtain the multiplicity of the sign-changing solutions which change sign exactly once. In particular, the number of solutions depends on the Poincare polynomial.

The second paper presents the study of the asymptotic behaviour for the second eigenvalue of the p-Laplacian operator as p goes to 1. In the particular case of a planar disc, it is possible to show that the second eigenfunctions are nonradial if p is close enough to 1. The main goal of the third paper is to present multiple solutions results for elliptic inclusions of Clarke's gradient type under Dirichlet boundary condition involving the p-Laplacian which, in general, depend on two parameters. The authors prove the existence of multiple constant-sign

and sign-changing (nodal) solutions for parameters specified in terms of the Fucik spectrum of the p-Laplacian.

The fourth paper is devoted to the quasilinear elliptic equation defined on the entire space. The author proves that the equation admits a positive ground-state solution in the entire space. Combining with some ideas due to Cerami-Solomini-Struwe, one nodal solution is obtained. In the fifth paper, by using the Fountain Theorem, the authors obtain infinitely many solutions for a class of superlinear elliptic problems with the Robin boundary value under weaker conditions than in the earlier papers. The authors of the sixth paper study the large solutions of the quasilinear elliptic system of competitive type with boundary blow-up conditions, including the existence, uniqueness, and asymptotic behavior of positive solutions via the methods of upper and lower solutions.

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