

Nonlinear elliptic problems on the Sierpinski gasket

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The Sierpinski gasket (SG, for short) in the n -dimensional Euclidean space is a natural generalization of the Sierpinski triangle in the plane, a well-known fractal whose construction goes back to the Polish mathematician Waclaw Sierpinski. Due to the work of J. Kigami, it turned out that one may study PDEs on the SG in spite of its highly non-smooth structure. By introducing, in his pioneering paper [5], the harmonic functions as well as the Laplace operator on the SG, Kigami developed a suitable framework, allowing the study of elliptic problems on this fractal. Kigami's paper was the starting point for subsequent papers devoted to PDEs on the SG. A list of them, including also several recent contributions, may be found in the introduction of the paper [4]. The talk, based on the papers [1]–[4], emphasizes that, even if the structure of this fractal differs considerably from that of open domains of Euclidean spaces, PDEs defined on it may be studied (as in the case of open domains) by means of certain variational methods and of appropriate abstract multiplicity theorems. There are presented several results concerning the existence of multiple weak solutions of Dirichlet problems defined on the SG.

References

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