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Multiplicity of Solutions for Anisotropic Discrete Boundary Value Problems

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Abstract

For the following discrete problem, our primary focus in this research is on existence and multiplicity results,

$$\begin{cases} -\Delta\left(|\Delta u(t-1)|^{P(t-1)-2}\Delta u(t-1)\right) = f(t,u(t)), \\ t \in [1,N]_{\mathbb{Z}}, \\ u(0) = u(N+1) = 0, \end{cases}$$

Where N≥2 is an integer, $[1,N]_{\mathbb{Z}}$ is the discrete interval {1, 2, 3,.....N} , Δ is the forward difference operator defined by Δu(t)=u(t+1)-u(t), f:$[1,N]_{\mathbb{Z}}\times\mathbb{R}\to\mathbb{R}$ is a continuous function in the second variable

and $p: [0,N]_{\mathbb{Z}} \longrightarrow [2,+\infty[$ is a fixed function.

References

[1] A.R. El Amrouss and O. Hammouti, Spectrum of discrete 2n-th order difference operator with periodic boundary conditions and its applications. Opuscula Math., 41 (4) (2021), pp. 489-509.

[2] A.R. El Amrouss and O. Hammouti, Multiplicity of solutions for the discrete boundary value problem involving the p-Laplacian. Arab J. Math. Sci. (2021). DOI 10.1108/AJMS-02-2021-0050.

[3] A.R. El Amrouss and O. Hammouti, Existence of multiple solutions to a discrete 2n-th order periodic boundary value problem via variational method. Sci. Bulletin-Series A, 83 (3) (2021), pp. 159-170.

[4] John R. Graef, Lingju Kong and Min Wang, Existence of multiple solutions to a discrete fourth order periodic boundary value problem. Discrete Contin. Dyn. Syst. suppl. (2013), 291-299.

[5] J. Zuo, O. Hammouti, S. Taarabti, Multiplicity of Solutions for Discrete 2n-TH Order Periodic Boundary Value Problem with φp-Laplacian, Axioms , 13(3) (2024), 1-15.