Existence results for nonlinear two-parametric quantum difference equation with first-order (p,q)-derivative

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Abstract

In this paper, we study the solvability of a nonlinear two-parametric quantum difference equation Dirichlet boundary value problem. At first, we provide and prove the formula of changing the order of integration for (p,q)-double integral. Second, We obtain the existence and uniqueness criteria of solutions for this kind of boundary value problem by using Banach contraction mapping principle, Leray-Schauder nonlinear alternative theorem and Leray-Schauder continuation theorem. At last, we give two examples to illustrate our results.

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