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Existence of solutions for boundary value problems of fractional differential equations with integral, anti-periodic and \( p \)-Laplacian operators. (Chinese. English summary) [Zbl 07366889]

Summary: Using the properties of the Green’s function and the principle of Banach contraction mapping, we prove the existence of solutions to the anti-periodic boundary value problem of a class of Caputo fractional differential equations with \( p \)-Laplacian operator. First, according to the fractional differential equations and the boundary conditions of integral and anti-periodic, the Green’s function related to the boundary value problem is obtained, and the properties of the Green’s function are studied. Then, the boundary value problem is transformed into the equivalent integral equation by applying the Green function, and the existence result of the solution of the boundary value problem is obtained. Finally, two corresponding examples are given to verify the rationality of the result.

MSC:

34B15 Nonlinear boundary value problems for ordinary differential equations
34A08 Fractional ordinary differential equations

Keywords:
Caputo fractional differential; \( p \)-Laplacian operator; boundary value problems; Banach compression mapping principle