HIGHER FRACTIONAL ORDER p-LAPLACIAN BOUNDARY VALUE PROBLEM AT RESONANCE ON AN UNBOUNDED DOMAIN

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Abstract

In this work, we use the Ge and Ren extension of Mawhin's coincidence degree theory to investigate the solvability of the p-Laplacian fractional order boundary value problem of the form $(\phi p(D0+\alpha x(t)))'=f(t,x(t),D0+\alpha-3x(t),D0+\alpha-2x(t),D0+\alpha-1x(t),D0+\alpha x(t)),t\in(0,+\infty),x(0)=0=D0+\alpha-3x(0),D0+\alpha-2x(0)=\int01D0+\alpha-2x(t)dA(t),\lim t\to+\infty D0+\alpha-1x(t)=\sum i=1m\mu iD0+\alpha-1x(\xi i),D0+\alpha x(\infty)=0,$ where $3<\alpha\leq4$. The conditions $\int01dA(t)=1,\int01tdA(t)=0,$ $\sum i=1m\mu i=1$ and $\sum i=1m\mu i\xi i-1=0$ are critical for resonance.

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