SCALAR MULTI-POINT BOUNDARY VALUE PROBLEMS AT RESONANCE

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Abstract. In this paper we discuss the solvability of multi-point boundary value problems of the form

\[ y^{(n)}(t) + a_{n-1}(t)y^{(n-1)}(t) + \cdots + a_0(t)y(t) = g(t, y(t)) \]

subject to

\[ \sum_{j=1}^{n} b_{ij}(0)y^{(j-1)}(t_0) + \sum_{j=1}^{n} b_{ij}(1)y^{(j-1)}(t_1) + \cdots + \sum_{j=1}^{n} b_{ij}(k)y^{(j-1)}(t_k) = 0 \]

for \( i = 1, \cdots, n \).

We improve upon existing results in the literature regarding multi-point boundary value problems. Our approach uses an alternative method along with Schaefer’s fixed point theorem.


Keywords and phrases: multi-point boundary value problems, resonance, Lyapunov-Schmidt procedure, Schaefer’s Fixed Point Theorem.

REFERENCES


