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Bound sets and two-point boundary value problems for second order differential equations.

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The authors study the existence of solutions to a generalized two-point boundary value problem of Floquet type for a vector second order nonlinear differential equation. More precisely, the problem under consideration is the following

$$\begin{cases} x'' = f(t, x, x'), & t \in [0, 1], \\ x(1) = Ax(0), \\ x'(1) = Bx'(0), \end{cases}$$

where $f : [0, 1] \times \mathbb{R}^{2m} \rightarrow \mathbb{R}^m$ is a continuous function and A and B are $m \times m$ square matrices, with A non-singular. Using a suitable version of Mawhin's continuation principle the authors prove a general existence result. Applications are given to the existence of solutions which are contained in suitable bound sets with possibly nonsmooth boundary.

Reviewer: [Francesca Papalini \(Ancona\)](#)

MSC:

[34B15](#) Nonlinear boundary value problems for ordinary differential equations

Cited in **6** Documents

[47H10](#) Fixed-point theorems

Keywords:

[Continuation principle](#); [coincidence degree](#); [second order differential systems](#); [bound sets](#); [Floquet type boundary conditions](#)