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Bounded solutions of Carathéodory differential inclusions: a bound sets approach. (English)

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Here, the authors prove the existence of bounded solutions to the following differential inclusion: $x' \in F(t,x)$, $t \in \mathbb{R}$, where $F : \mathbb{R} \times \mathbb{R}^N \to \mathbb{R}^N$ is a Carathéodory multivalued map, with nonempty, compact and closed values.

In order to do so, they first solve an appropriate Floquet boundary value problem using a bound sets technique, which relies on the construction of bounding functions which are either continuous or locally Lipschitz and also a modification of a continuation principle due to the first author, *G. Gabor* and *L. Górniewicz* [Trans. Am. Math. Soc. 351, 4861–4903 (1999; Zbl 0936.34023)]. Then, they apply a sequential approach to get a solution to the original problem.

The paper is very clear, discusses in detail previous results in the area, contains two examples and concludes with suggestions for further research: generalization into L^2 spaces and problems related to retarded functional-differential inclusions.

Reviewer: Nikolaos G. Yannakakis (Athens)

MSC:

34A60	Ordinary differential inclusions
34B15	Nonlinear boundary value problems for ordinary differential equations
34B40	Boundary value problems on infinite intervals for ordinary differential equations

Keywords:

Bound sets technique; Floquet problems; bounding function; differential inclusion; Carathéodory multifunction; set-valued map; bounded solutions; upper semicontinuous multifunction

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