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Impulsive differential equations: periodic solutions and applications. (English) Zbl 0815.34001
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The so-called impulsive theory develops in several distinct directions, that one presented in the book is closely related with impulsive differential equations (IDE) and which such modern authors as A. M. Samoilenko, N. A. Perestyuk, D. Bainov and V. Lakshmikantham. Note that all monographs devoted to IDE have appeared after 1987 when Samoilenko and Perestyuk's book "Differential equations with impulsive effect", Višča Škola, Kiev, 1987 (in Russian) had been published (now an enlarged English version is in preparation). The book under review deals essentially with periodic boundary value problems for finite- dimensional IDE with a finite number of fixed (or unfixed) moments of impulsive effects on a period. The authors collect a considerable amount of material concerning the subject. We find here new authors' results as well as theorems adapted from diverse sources (together with the necessary bibliographical notes and comments). All the time underlining the specific features of IDE, the authors give a clear introduction to the methods of investigation of periodic impulsive systems. More than 25 interesting and accurately analyzed examples help reach this goal. References includes 92 items up to 1992 (rather surprisingly however, that there isn't any (!) reference on J. Kurzweil and Š. Schwabik's works on generalized differential equations). The book is organized as follows: Chapter 1 Preliminary notes. Chapter 2 Linear impulsive periodic systems. The weakly nonlinear systems are studied in Chapter 3 (noncritical case) and Chapter 4 (critical case). Chapter 5 deals with the existence problem for strictly nonlinear periodic IDE. Finally, in Chapter 6 various approximate methods for finding periodic solutions of IDE are considered. In my view, for the time being this book contains most complete information on the periodic BVP and applications.

Reviewer: [S.I.Trofimchuk \(Kiev\)](#)

MSC:

- [34-02](#) Research exposition (monographs, survey articles) pertaining to ordinary differential equations
- [34A37](#) Ordinary differential equations with impulses
- [34C25](#) Periodic solutions to ordinary differential equations

Cited in **5** Reviews
Cited in **761** Documents

Keywords:

[impulsive differential equations](#); [periodic boundary value problems](#); [periodic solutions](#)