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Generalized differential equations. Special results. (English) Zbl 0821.34002

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From the preface: “This work is a continuation of my text Generalized differential equations: Fundamental results which appeared in the same series [see *ibid.* 95, No. 6, 103 p. (1985; [Zbl 0594.34002](#))]. The present notes form a whole with the above mentioned ones. They are centered around the results on continuous dependence of solutions of generalized differential equations on a parameter, which are given in the second section. In the third section the method of averaging is presented and it is also shown how the results can be used for the substantiation of the method averaging of in the case of differential equations with impulses in the setting of A. M. Samoilenko and the Kiev school of differential systems with discontinuous solutions. The fourth section is devoted to the convergence effect when the coefficient in a system of classical ordinary differential equations tends to the Dirac delta function. Convergence effects of this type are covered by the concept of emphatic convergence which belongs to J. Kurzweil from the earliest times of the theory of generalized differential equations. The generalized differential equations complete in a certain sense the class of classical Carathéodory differential equations. This is an inspiration for developing the concept of a local dynamical system for generalized differential equations similarly as it is done by G. R. Sell for nonautonomous classical ordinary differential equations. In the fifth section we follow the lines of the work of Z. Artstein in this field. Variational stability with respect to perturbations is the subject of the concluding section”.

MSC:

- [34-02](#) Research exposition (monographs, survey articles) pertaining to ordinary differential equations
- [34A12](#) Initial value problems, existence, uniqueness, continuous dependence and continuation of solutions to ordinary differential equations
- [34C29](#) Averaging method for ordinary differential equations
- [34D20](#) Stability of solutions to ordinary differential equations
- [34A99](#) General theory for ordinary differential equations

Keywords:

variational stability with respect to perturbations; continuous dependence of solutions of generalized differential equations on a parameter; averaging; differential equations with impulses; emphatic convergence; local dynamical system