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Permanence of a logistic type impulsive equation with infinite delay

Many evolution processes are characterized by the fact that at certain moments of time they experience a change of state abruptly. Theses processes are subject to short-time perturbations whose duration is negligible in comparison with the duration of the process. Consequently, it is natural to assume that these perturbations act instantaneously, that is, in the form of impulses. It is known, for example, that many biological phenomena involving thresholds, bursting rhythm models in medicine and biology, optimal control models in economics, pharmacokinetics and frequency modulated systems, do exhibit impulsive effects.

In this presentation we give an introduction to theory of impulsive differential equations. Impulsive differential equations, that is, differential equations involving impulse effects, appear as a natural description of observed evolution phenomena of several real world problems. We investigate a non-autonomous Logistic type impulsive equation with infinite delay. For the general non-autonomous case, some sufficient conditions which guarantee the permanence of solutions are obtained. Our results extend a known result of Seifert [1]. This presentation is based on the paper [2].

References

[1] G. Seifert, *Almost periodic solutions for delay Logistic equations with almost periodic time dependence* Differential and Integral Equations **9** (2) (1996) 335–342.

[2] X. Yang, W. Wang and J. Shen, *Permanence of a logistic type impulsive equation with infinite delay* Applied Mathematics Letters **24** (2011) 420–427.