Global stability for impulsive delay differential equations and application to a periodic Lasota-Wazewska model

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Abstract

In this talk, we present a global stability criterion for the zero solution of the following impulsive scalar differential equation

$$\begin{aligned} &x'(t) + a(t)x(t) = f(t, x_t), \quad 0 \le t \neq t_k, \\ &\Delta(x(t_k)) := x(t_k^+) - x(t_k) = I_k(x(t_k)), \quad k = 1, 2, \ldots, \end{aligned}$$

assuming an Yorke-type condition. The main result can be applied to study the stability of other solutions, such as periodic solutions. As an illustration, we analyse the global attractivity of a positive periodic solution of a general impulsive periodic Lasota-Wazewska model with delays.