Exponential stability for impulsive functional differential equations with infinite delay

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Abstract

In this talk, we establish sufficient conditions for the exponential stability of an equilibrium point of the following general system of infinite delay differential equations with impulses:

$$\begin{cases} \dot{x}_i(t) = -a_i(x_i(t))[b_i(x_i(t)) + f_i(t, x_t)],\ 0 \le t \ne t_k,\ i = 1, 2, \dots n, \\ (x_i(t_k)) = x_i(t_k^+) - x_i(t_k^-) = I_{ik}(x_i(t_k^-)),\ k \in \mathbb{N}. \end{cases} \tag{1}$$

The main result is used to give a stability criterion for a very broad family of impulsive neural network model with both unbounded distributed delays and bounded time-varying discrete delays with impulses. Most of the impulsive neural network models with delay recently studied are included in the general framework presented and we give a example which illustrate the effectiveness of the result.