Anokhin, A.; **Berezansky, L.**; **Braverman, E.**
Exponential stability of linear delay impulsive differential equations. (English) Zbl 0837.34076
J. Math. Anal. Appl. 193, No. 3, 923-941 (1995).

This article deal with a linear delay impulsive differential equation $x'(t) + \sum_{i=1}^{m} A_i(t)x[h_i(t)] = r(t)$ $(0 < t < \infty,\ t \neq \tau_j)$, $x(\tau_j) = B_j x(\tau_j - 0)$ $(j = 1, 2, \dots)$ under natural conditions for $A_i(t)$, $h_i(t)$, B_j, τ_j and $r(t)$. The main results are a theorem about integral representations of solutions to the Cauchy problem for the above equation and a variant of the Bohl-Perron theorem about the exponential stability of this equation under assumptions that each its solution with the first derivative are bounded for each bounded right hand side $r(t)$. The simple explicit condition of exponential stability in terms of coefficients $A_i(t)$ and B_j is also presented. In the end of the article some illustrating examples are presented.

Reviewer: P.Zabreiko (Minsk)

MSC:

34K20 Stability theory of functional-differential equations
34A37 Ordinary differential equations with impulses

Keywords:

linear delay impulsive differential equation; integral representations of solutions to the Cauchy problem; Bohl-Perron theorem about the exponential stability

Full Text: DOI arXiv Link