Asymptotic behavior of the solutions of a partial differential equation with piecewise constant argument

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Abstract

In this paper we study the partial differential equation with piecewise constant argument of the form : \[\begin{array}{lll} x_t(t,s)=&A(t)x(t,s)+B(t,s)x([t],s)+C(t,s)x(t,[s])+\\[0.5cm] &D(t,s)x([t],[s])+f(x(t,[s])),\ \ t,s\in \Rˆ{+}=(0,\infty) \end{array} \] where $A(t)$ is a $k\times k$ invertible and continuous matrix function on $\Rˆ{+}$, $B(t,s)$, $C(t,s)$, $D(t,s)$ are $k \times k$ continuous and bounded matrix functions on $\Rˆ{+}\times \Rˆ{+}$, $[t]$, $[s]$ are the integral parts of t,s respectively and $f:\Rˆk\rightarrow \Rˆk$ is a continuous function. More precisely under some conditions on the matrices $A(t)$, $B(t,s)$, $C(t,s)$, $D(t,s)$ and the function f we investigate the asymptotic behaviour of the solutions of the above equation. \end{abstract}

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