

Cauchy and Green matrices type and stability in alternately advanced and delayed differential systems

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In this paper, we study differential equations with piecewise constant argument of generalized (DEPCAGs) type, i.e., the argument is a general step function. They are hybrid equations combining properties of continuous and discrete equations. The play of the discrete part is always very important. The explicit solutions of the homogeneous and non-homogeneous linear DEPCAGs systems are obtained. Existence, uniqueness and stability of the solutions of the quasilinear DEPCAGs are under discussion. All previous results are improved. The importance of the advanced and delayed intervals will be clear. Cauchy and Green matrices type are deduced. The integral representation and Gronwall's inequality type obtained can be fruitfully applied to the investigation of stability, oscillations, controllability and many other problems of DEPCAGs. © 2011 Taylor & Francis.