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Cemil Buyukadali* (bcemil@metu.edu.tr), Department of Mathematics, Middle East Technical University, 06531 Ankara, Turkey, and **Marat Akhmet** (marat@metu.edu.tr), Department of Mathematics, Middle East Technical University, 06531 Ankara, Turkey. *On periodic solutions of quasilinear differential equations with piecewise constant argument of generalized type in critical case.*

The periodic quasilinear system of differential equations with small parameter and piecewise constant argument of generalized type [M.U. Akhmet, On the reduction principle for differential equations with piecewise argument of generalized type, J. Math. Anal. Appl. 336 (2007) 646–663] is addressed. We consider the critical case, when associated linear homogeneous system admits nontrivial periodic solutions. Criteria of existence of periodic solutions of such equations are obtained. One of the main auxiliary results of our paper is an analogue of Gronwall Bellman Lemma for functions with piecewise constant and retarded advanced type arguments. Dependence of solutions on the parameter is investigated. Appropriate examples are given to show our results. (Received September 12, 2008)