Dynamics of Continuous, Discrete and Impulsive Systems
Series **A:** *Mathematical Analysis* **21 (2014)** 259-266
 http://www.watam.org

PARTIAL EQUIASYMPTOTIC STABILITY IN MEASURE FOR DELAY DIFFERENTIAL EQUATIONS

M. A. Benᡠ[1] and S. M. S. de Godoy[2]

[1] Departamento de Computação e Matemática
Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto
Universidade de São Paulo
14040-901 Ribeirão Preto, SP, Brasil

[2] Departamento de Matemática
Instituto de Ciências Matemáticas e de Computação
Universidade de São Paulo-Campus de São Carlos, Caixa Postal-668
13560-970 São Carlos, SP, Brasil

Corresponding author email: smsgodoy@icmc.usp.br

Abstract. This paper establishes new partial stability criteria in terms of two measures for a system of functional differential equations using Liapunov functions. Theorems on partial equiasymptotic stability in measure are proved. An example is given to illustrate the results obtained.

Keywords. Delay differential equation, stability in measure, partial stability in measure, equiasymptotic stability in measure, Liapunov functional.

AMS (MOS) subject classification: 34K20

References

[1] M.A. BENÁ, S.M.S. GODOY, *On the stability in terms of two measures of perturbed neutral functional differential equations,* Nonlinear Anal.,Vol 47, 7 (2001), pp. 4567-4578.

[2] C. CORDUNEANU, *Sur la stabilit partielle,* Rev. Roum. Math. Pures Appl.,Vol 9, 3 (1964), pp. 229-236.

[3] P. FERGOLA, C. TENNERIELLO, *Lotka-Volterra models: partial stability and partial ultimate boundedness,* in *Biomathematics and Related Computational Problems* (L.M. Ricciard, Ed.) Kluwer, Dordercht, (1988), pp.283-294.

[4] S.M.S. GODOY, M.A. BENÁ, *Stability criteria in terms of two measures of functional differential equations,* Appl. Math. Lett.,Vol 18, 6 (2005), pp. 701-706.

[5] J.K. HALE, *Theory of Functional Differential Equations,* Springer Verlag, New York, 1977.

[6] L. HATVANI, *On the partial asymptotic stability by the method of limiting equation,* Ann. Mat. Pura Appl.,Vol 4, 139 (1985), pp. 65-82.

[7] S.G. HRISTOVA, *Stability on a cone in terms of two measures for impulsive differential equations with "supremum",* Appl. Math. Lett., 23 (2010), no. 5, pp. 508-511.

[8] S.G. HRISTOVA, *Integral stability in terms of two measures for impulsive functional differential equations,* Math. Comput. Modelling, 51 (2010), no. 1-2, pp. 100-108.

[9] A.O. IGNATYEV, *On the partial equiasymptotic stability in functional differential equations,* J. Math. Anal. Appl.,Vol 268, (2002), pp. 615-628.

[10] N.N. KRASOVSKII, *Stability of Motion,* Stanford Univ. Press, Stanford, 1963.

[11] V. LAKSHMIKANTHAM, S. LEELA, A.A. MARTYNYUK, *Stability analysis of nonlinear systems,* Marcel Dekker, New York, 1989.

[12] X. LIU, Q. WANG, *On stability in terms of two measures for impulsive systems of functional differential equations,* J. Math. Anal. Appl., Vol 326, (2007), pp. 252-265.

[13] V.V. RUMYANTSEV, *On the stability with respect to a part of the variables,* Symp. Math.,Vol 6, (1971), pp. 243-265.

[14] V.I. VOROTNIKOV, *On the theory of partial stability,* J. Appl. Maths. Mechs, vol 59, 4 (1995), pp. 525-531.

[15] V.I. VOROTNIKOV, *Partial stability and control: The state-of-the-art and development prospects (Reviews),* Automation and Remote Control,Vol 66, 4 (2005), pp. 511-561.

[16] P. WANG, H. LIAN, *On the stability in terms of two measures for perturbed impulsive integro-differential equations,* J. Math. Anal. Appl., 313 (2006), no. 2, pp. 642-653.

Received November 2012; revised May 2013.

email: journal@monotone.uwaterloo.ca
http://monotone.uwaterloo.ca/∼journal/