Monteiro, Giselle Antunes; Slavík, Antonín
Linear measure functional differential equations with infinite delay. (English) Zbl 1305.34108
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Summary: We use the theory of generalized linear ordinary differential equations in Banach spaces to study linear measure functional differential equations with infinite delay. We obtain new results concerning the existence, uniqueness, and continuous dependence of solutions. Even for equations with a finite delay, our results are stronger than the existing ones. Finally, we present an application to functional differential equations with impulses.

MSC:

34K06 Linear functional-differential equations
34K45 Functional-differential equations with impulses
34K30 Functional-differential equations in abstract spaces

Keywords:

measure functional differential equations; infinite delay

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References:

[1] Afonso, Discontinuous local semiflows for Kurzweil equations leading to LaSalle's invariance principle for differential systems with impulses at variable times, J. Differ. Equations 250 pp 2969– (2011) · Zbl 1213.34019 · doi:10.1016/j.jde.2011.01.019

[2] Bohner, Dynamic Equations on Time Scales: An Introduction with Applications (2001) · Zbl 0978.39001 · doi:10.1007/978-1-4612-0201-1

[3] Federson, Measure functional differential and functional dynamic equations on time scales, J. Differ. Equations 252 pp 3816– (2012) · Zbl 1239.34076 · doi:10.1016/j.jde.2011.11.005

[4] Federson, Basic results for functional differential and dynamic equations involving impulses, Math. Nachr. 286 (2-3) pp 181– (2013) · Zbl 1266.34115 · doi:10.1002/mana.201200006

[5] Federson, Generalized ODE approach to impulsive retarded functional differential equations, Differ. Integral Equ. 19 (11) pp 1201– (2006) · Zbl 1212.34251

[6] Hale, Introduction to Functional Differential Equations (1993) · Zbl 0787.34002 · doi:10.1007/978-1-4612-4342-7

[7] Hale, Phase space for retarded equations with infinite delay, Funkcial. Ekvac. 21 pp 11– (1978) · Zbl 0383.34055

[8] Hino, Functional Differential Equations with Infinite Delay (1991) · Zbl 0732.34051 · doi:10.1007/BFb0084432

[9] Hönig, Volterra Stieltjes-Integral Equations, Mathematics Studies (1975)

[10] Imaz, Generalized ordinary differential equations in Banach spaces and applications to functional equations, Bol. Soc. Mat. Mexicana 11 pp 47– (1966) · Zbl 0178.44203

[11] Kurzweil, Generalized ordinary differential equation and continuous dependence on a parameter, Czech. Math. J. 7 (82) pp 418– (1957) · Zbl 0090.30002

[12] Kurzweil, Generalized Ordinary Differential Equations. Not Absolutely Continuous Solutions (2012) · Zbl 1248.34001 · doi:10.1142/7907

[13] Monteiro, Generalized linear differential equations in a Banach space: Continuous dependence on a parameter, Discrete Contin. Dyn. Syst. 33 (1) pp 283– (2013)

[14] Oliva, Functional equations and generalized ordinary differential equations, Bol. Soc. Mat. Mexicana 11 pp 40– (1966) · Zbl 0178.44204

[15] Slavík, Dynamic equations on time scales and generalized ordinary differential equations, J. Math. Anal. Appl. 385 pp 534– (2012) · Zbl 1235.34247 · doi:10.1016/j.jmaa.2011.06.068

[16] Slavík, Measure functional differential equations with infinite delay, Nonlinear Anal. 79 pp 140– (2013) · Zbl 1260.34123 · doi:10.1016/j.na.2012.11.018

[17] Schwabik, Generalized Ordinary Differential Equations (1992) · doi:10.1142/1875

[18] Schwabik, Abstract Perron-Stieltjes integral, Math. Bohem. 121 (4) pp 425– (1996) · Zbl 0879.28021

[19] Schwabik, Linear Stieltjes integral equations in Banach spaces, Math. Bohem. 124 (4) pp 433– (1999) · Zbl 0937.34047

[20] Schwabik, Linear Stieltjes integral equations in Banach spaces II; Operator valued solutions, Math. Bohem. 125 pp 431– (2000) · Zbl 0974.34057