IMPULSIVE EVOLUTION INCLUSIONS WITH INFINITE DELAY AND MULTIVALUED JUMPS

Mouffak Benchohra and Mohamed Ziane

Abstract. In this paper we prove the existence of a mild solution for a class of impulsive semilinear evolution differential inclusions with infinite delay and multivalued jumps in a Banach space.

Full text

References

[1] N. Abada, R. Agarwal, M. Benchohra and H. Hammouche, Existence results for nondensely defined impulsive semilinear functional differential equations with state-dependent delay, *Asian-Eur. J. Math.* **1** (2008), no. 4, 449-468. MR2474181(2009i:34179). Zbl 1179.34070.

[2] N. Abada, M. Benchohra, H. Hammouche, Existence and controllability results for impulsive partial functional differential inclusions, *Nonlinear Anal.* **69** (2008) 2892-2909. MR2452100(2009h:34088). Zbl 1160.34068.

[3] N. Abada, M. Benchohra, H. Hammouche, Nonlinear impulsive partial functional differential inclusions with state-dependent delay and multivalued jumps, *Nonlinear Anal.* **4** (2010) 791-803. MR2680247(2011h:34132). Zbl 1207.34077.

[4] N.U. Ahmed, *Semigroup Theory with Applications to Systems and Control*, in: Pitman Research Notes in Mathematics Series, vol. 246, Longman Scientific & Technical, Harlow, John Wiley & Sons, New York, 1991. MR1100706(92e:47069). Zbl 0727.47026.

[5] N.U. Ahmed, *Dynamic Systems and Control with Applications*, World Scientific Publishing, Hackensack, NJ, 2006. MR2257896(2007m:93001). Zbl 1127.93001.

[6] N.U. Ahmed, Systems governed by impulsive differential inclusions on Hilbert spaces, *Nonlinear Anal.* **45** (2001) 693-706. MR1841203(2002e:34016). Zbl 0995.34053.

[7] D.D. Bainov, P.S. Simeonov, *Systems with Impulsive Effect*, Horwood, Chichester, 1989. MR1010418(90i:93082). Zbl 0683.34032.

[8] M. Benchohra, J. Henderson, S.K. Ntouyas, *Impulsive Differential Equations and Inclusions*, vol. 2, Hindawi Publishing Corporation, New York, 2006. MR2322133(2008f:34001). Zbl 1130.34003.

[9] M. Benchohra, S.K. Ntouyas, Nonlocal Cauchy problems for neutral functional differential and integrodifferential inclusions in Banach spaces, *J. Math. Anal. Appl.* **258** (2001) 573-590. MR1835560(2002d:34130). Zbl 0982.45008.

[10] I. Benedetti, An existence result for impulsive functional differential inclusions in Banach spaces, *Discuss. Math. Differ. Incl. Control Optim.* **24** (2004), 13-30. MR2118212(2005j:34014). Zbl 1071.34087.

[11] I. Benedetti, P. Rubbioni, Existence of solutions on compact and non-compact intervals for semilinear impulsive differential inclusions with delay. *Topol. Methods Nonlinear Anal.* **32** (2008), 227-245. MR2494056(2010f:34114). Zbl 1189.34125.

[12] T. Cardinali, P. Rubbioni, On the existence of mild solutions of semilinear evolution differential inclusions, *J. Math. Anal. Appl.* **308** (2005), 620-635. MR2150113(2006a:34172). Zbl 1083.34046.

[13] A. Freidman, *Partial Differential Equations.* Holt, Rinehat and Winston, New York, 1969. MR445088(56 #3433). Zbl 0224.35002.

[14] L. Górniewicz, *Topological Fixed Point Theory of Multivalued Mappings*, Topological Fixed Point Theory and Its Applications Vol. 4, Kluwer Academic Publishers, Dordrecht, Second edition, 2006. MR2238622(2007f:58014). Zbl 1107.55001.

[15] C. Gori, V. Obukhovskii, M. Ragni and P. Rubbioni, Existence and continuous dependence results for semilinear functional differential inclusions with infinite delay, *Nonlinear Anal.* **51** (2002), 765-782. MR1921375(2003f:34149). Zbl 1018.34076.

[16] J. Hale, J. Kato, Phase space for retarded equations with infnite delay, *Funkcial. Ekvac.* **21** (1978), 11-41. MR0492721(58 #11793). Zbl 0383.34055.

[17] J.K. Hale, S.M. Verduyn Lunel, *Introduction to Functional Differential Equations*, in: Applied Mathematical Sciences, vol. 99, Springer- Verlag, New York, 1993. MR1243878(94m:34169). Zbl 0787.34002.

[18] Y. Hino, S. Murakami and T. Naito, *Functional-differential equations with infnite delay*, Lecture Notes in Mathematics, Vol. 1473, Berlin, Springer- Verlag, 1991. MR1122588(92g:34088). Zbl 0732.34051.

[19] Sh. Hu, N. Papageorgiou, *Handbook of Multivalued Analysis*, Volume I: Theory, Kluwer Academic Publishers, Dordrecht, 1997. MR1485775(98k:47001). Zbl 0887.47001.

[20] M. Kamenskii, V. Obukhovskii, P. Zecca, *Condensing Multivalued Maps and Semilinear Differential Inclusions in Banach Spaces*, in: de Gruyter Series in Nonlinear Analysis and Applications, Berlin, 2001. MR1831201(2002e:47066). Zbl 0988.34001.

[21] M. Kisielewicz, *Differential Inclusions and Optimal Control*, Kluwer Academic Publishers, Dordrecht, The Netherlands, 1991. MR1135796(93c:49001). Zbl 0731.49001.

[22] V. Lakshmikantham, D.D. Bainov, P.S. Simeonov, *Theory of Impulsive Differential Equations*, World Scientific, Singapore, 1989. MR1082551(91m:34013). Zbl 0719.34002.

[23] S. Migorski, A. Ochal, Nonlinear impulsive evolution inclusions of second order, *Dynam. Systems Appl.* **16** (2007), 155-173. MR2305434(2008a:34137). Zbl 1128.34038.

[24] V. Obukhovskii, J.-C. Yao, On impulsive functional differential inclusions with Hille-Yosida operators in Banach spaces. *Nonlinear Anal.* **73** (2010), 1715-1728. MR2661354(2011m:34184). Zbl 1214.34052.

[25] A.M. Samoilenko, N.A. Perestyuk, *Impulsive Differential Equations*, World Scientific, Singapore, 1995. MR1355787(97i:34002). Zbl 0837.34003.

[26] J. Wu, *Theory and Applications of Partial Functional Differential Equations*, in: Applied Mathematical Sciences, vol. 119, Springer-Verlag, New York, 1996. MR1415838(98a:35135). Zbl 0870.35116.

Mouffak Benchohra   Mohamed Ziane

Laboratoire de Mathématiques,   Départemaent des Mathématiques,

Université de Sidi Bel-Abbès,   IUniversité de Tiaret,

B.P. 89, 22000, Sidi Bel-Abbès, Algérie. B.P. 78, 14000, Tiaret, Algérie.

e-mail: benchohra@yahoo.com   e-mail: ziane@mail.univ-tiaret.dz