Tomáš Bárta

Nonmonotone nonconvolution functions of positive type and applications

Comment.Math.Univ.Carolin. 53,2 (2012) 211 -220.

Abstract: We present two sufficient conditions for nonconvolution kernels to be of positive type. We apply the results to obtain stability for one-dimensional models of chemically reacting viscoelastic materials.

Keywords: functions of positive type, nonconvolution integral equation, chemically reacting viscoelastic fluid

AMS Subject Classification: 42A82, 45A05, 45M05, 76A10

References

- Bárta T., Global existence for a nonlinear model of 1D chemically reacting viscoelastic body, preprint, 2012.
- [2] Bulíček M., Málek J., Rajagopal K.R., Mathematical results concerning unsteady flows of chemically reacting incompressible fluids (English summary) Partial differential equations and fluid mechanics, 2653, London Math. Soc. Lecture Note Ser., 364, Cambridge Univ. Press, Cambridge, 2009.
- [3] Cannarsa P., Sforza D., Integro-differential equations of hyperbolic type with positive definite kernels, J. Differential Equations 250 (2011), no. 12, 4289-4335.
- [4] Gripenberg G., Londen S.O., Staffans O., Volterra integral and functional equations, Encyclopedia of Mathematics and its Applications, 34, Cambridge University Press, Cambridge, 1990.
- [5] Halanay A., On the asymptotic behavior of the solutions of an integro-differential equation,
 J. Math. Anal. Appl 10 (1965), 319-324.
- [6] Kiffe T., On nonlinear Volterra equations of nonconvolution type, J. Differential Equations 22 (1976), no. 2, 349-367.
- [7] Mustapha K., McLean W., Discontinuous Galerkin method for an evolution equation with a memory term of positive type, Math. Comp. 78 (2009), no. 268, 1975-1995.
- [8] Prüss J., Evolutionary Integral Equations and Applications, Monographs in Mathematics, 87, Birkhäuser, Basel, 1993.
- [9] Rajagopal K.R., Wineman A.S., A note on viscoelastic materials that can age, International Journal of Non-Linear Mechanics 39 (2004), 1547–1554.
- [10] Rajagopal K.R., Wineman A.S., Applications of viscoelastic clock models in biomechanics, Acta Mechanica 213 (2010), no. 3-4, 255-266.
- [11] Renardy M., Hrusa W.J., Nohel J.A., Mathematical problems in viscoelasticity, Pitman Monographs and Surveys in Pure and Applied Mathematics, 35, Longman Scientific & Technical, Harlow; John Wiley & Sons, Inc., New York, 1987.
- [12] Tatar N.-E., Long time behavior for a viscoelastic problem with a positive definite kernel, Aust. J. Math. Anal. Appl. 1 (2004), no. 1, Art. 5, 11 pp.