# Monotone iterative techniques for discontinuous functional impulsive equations

Alberto Cabada, Jan Tomeček

Santiago de Compostela, Spain, Olomouc, Czech Republic

In this talk we derive sufficient conditions for the existence of extremal solutions for a second order nonlinear functional $\phi$-Laplacian boundary value problem with impulses, subject to a general type of boundary value conditions which cover Dirichlet and multipoint boundary data as particular cases. Our main assumption here is the existence of upper and lower solutions together with growth restrictions of Nagumo's type. Discontinuous functional dependence of the nonlinear data and the boundary conditions are allowed. To calculate the exact expression of the extremal solutions we develop monotone iterative techniques.

**References**

[1] A. Cabada and S. Heikkilä, Extremality and Comparison Results for Discontinuous Third Order Functional Initial-Boundary Value Problems. *J. Math. Anal. Appl.* **255** (2001 ) 195 – 212.

[2] A. Cabada and J. Tomeček, Extremal Solutions for Nonlinear Functional $\phi$ – Laplacian Impulsive Equations. *Nonlinear Anal. T.M.A.* **67** (2007) 827 – 841.

[3] A. Cabada and J. Tomeček, Existence of Extremal Solutions for Nonlinear Discontinuous Impulsive Functional $\phi$ – Laplacian Equations with Nonlinear Discontinuous Functional Boundary Conditions. *Mem. Differential Equations Math. Phys.* **40** (2007) 1 – 16.

[4] S. Heikkilä and V. Lakshmikantham, "Monotone Iterative Techniques for Discontinuous Nonlinear Differential Equations", *Marcel Dekker, New York,* 1994.