On g-differential equations and the Kurzweil-Stieltjes integral

Giselle A. Monteiro

Prague, Czech Republic

A g-differential equation is a differential problem in which the usual derivative is replaced by a Stieltjes derivative. More precisely:

$$x'_g(t) = f(t, x(t)), \quad t \in [0, T], \tag{1}$$

where x'_g denotes the derivative with respect to a given function g. The basic theory in the case when g is a monotone function has been developed by Frigon and Lopes Pouso in [1]. Herein we consider g-differential problems for left-continuous regulated functions g and we investigate the equivalence between (1) and a Stieltjes integral equation

$$x(t) = x_0 + \int_0^t f(s, x(s))dg(s), \quad t \in [0, T],$$

where the integral is understood in the Kurzweil-Stieltjes sense.

This is a joint work with Bianca Satco (Stefan cel Mare University of Suceava, Romania).

2010 Mathematics Subject Classification: 34A12, 34A36.

References

[1] M. Frigon and R. López Pouso, Theory and applications of first-order systems of Stieltjes differential equations. *Adv. in Nonlinear Analysis* **6**(1) (2016) 13–36. doi: 10.1515/anona-2015-0158.

[2] G. A. Monteiro and B. Satco, Distributional, differential and integral problems: Equivalence and existence results, *Electron. J. Qual. Theory Differ. Equ.* **7** (2017), 1–26. doi: 10.14232/ejqtde.2017.1.7