ABOUT THE EXISTENCE OF SOLUTIONS FOR A HYBRID
NONLINEAR GENERALIZED FRACTIONAL PANTOGRAPH EQUATION

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Abstract. The main purpose of this paper is to study the existence of solutions for the following hybrid nonlinear fractional pantograph equation

\[
\begin{aligned}
D^{\alpha}_{0+} & \left( \frac{x(t)}{f(t,x(t),x(\varphi(t)))} \right) = g(t,x(t),x(\rho(t))), \quad 0 < t < 1 \\
x(0) = 0,
\end{aligned}
\]

where \( \alpha \in (0,1) \), \( \varphi \) and \( \rho \) are functions from \([0,1]\) into itself and \( D^{\alpha}_{0+} \) denotes the Riemann-Liouville fractional derivative. The main tool of our study is a generalization of Darbo's fixed point theorem associated to measures of non-compactness. Also, we present an example illustrating our results.


Keywords and phrases: Measure of non-compactness, Darbo’s fixed point theorem, hybrid fractional pantograph equation.

REFERENCES