

## EXISTENCE OF AN UNBOUNDED SOLUTION FOR MULTI-POINT BOUNDARY VALUE PROBLEMS OF FRACTIONAL DIFFERENTIAL EQUATIONS ON AN INFINITE DOMAIN

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*Abstract.* In this paper, considering the fractional boundary value problem

$$\begin{cases} D_{0+}^{\alpha} u(t) + a(t)f(t, u(t), u'(t)) = 0; & t \in (0, \infty), \quad \alpha \in (2, 3), \\ u(0) = u'(0) = 0, \quad \lim_{t \rightarrow \infty} D_{0+}^{\alpha-1} u(t) = \sum_{i=1}^m \beta_i D_{0+}^{\alpha-1} u(t) \Big|_{t=\xi_i}, \\ 0 < \xi_1 < \xi_2 < \dots < \xi_m < \infty, \quad \beta_i \in \mathbb{R}, \end{cases}$$

where  $D_{0+}^{\alpha}$  represents Riemann-Liouville fractional derivative of order  $\alpha$  and using famous Leray-Schauder Nonlinear Alternative theorem, we will obtain an unbounded solution of above BVP. At the end some examples illustrate.

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