# Solvability of a nonlinear general third order four point eigenvalue problem on time scales

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ABSTRACT.

We consider the four point boundary value problem for third order nonlinear differential equation on time scales

$$y^{\Delta^3}(t) + \lambda f(t, y, y^\Delta, y^{\Delta^2}) = 0, \ t \in [t_1, \sigma^3(t_4)]_{\mathbb{T}}$$

subject to the boundary conditions

$$y(t_1) = 0, \ y(t_2) = 0, \ \beta y(t_3) - \alpha y(\sigma^3(t_4)) = 0$$

where $t_1 \leq t_2 \leq t_3 \leq \sigma^3(t_4), \alpha > 0, \beta > 0$. Values of the parameter $\lambda$ are determined for which the boundary value problem has a positive solution by utilizing a fixed point theorem on cone.

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