Positive solutions to a third order nonlocal boundary value problem with positive parameter

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We present some sufficient conditions implying the existence of positive and increasing solutions to a third order differential equation of the form

$$-u''' + m^2 u' = f(t, u, u'), \quad t \in [0, 1], \tag{1}$$

subject to nonlocal boundary conditions

$$u(0) = 0, \ u'(0) = \alpha[u], \ u'(1) = \beta[u], \tag{2}$$

where $m > 0$ and α and β are the functionals acting on the space $C^1[0, 1]$. Our approach is based on the Krasnosel'ski-Guo fixed point theorem in cones and the properties of the Green's function corresponding to (1)-(2).

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