1086-34-213 **John R. Graef*** (john-graef@utc.edu), Department of Mathematics, University of Tennessee at Chattanooga, Chattanooga, TN 37403, and **Lingju Kong**, **Qingkai Kong** and **Min Wang**.

Uniqueness and parameter dependence of positive solutions to a higher order boundary value problem with fractional q-derivatives.

We study the boundary value problem with fractional q-derivatives

$$-(D_q^\nu u)(t) = \lambda f(t,u),\ t \in (0,1),$$

$$(D_q^i u)(0) = 0,\ i = 0,\dots,n-2, \quad (D_q u)(1) = \sum_{j=1}^{m} a_j (D_q u)(t_j),$$

where $q \in (0,1)$, $m \geq 1$ and $n \geq 2$ are integers, $n-1 < \nu \leq n$, $\lambda > 0$ is a parameter, $f : [0,1] \times [0,\infty) \to [0,\infty)$ is continuous, $a_i \geq 0$ and $t_i \in (0,1)$ for $i = 1,\dots,m$, and D_q^ν is the q-derivative of Riemann-Liouville type of order ν. The existence, uniqueness, and dependence of positive solutions on the parameter λ are discussed. Two sequences are constructed so that they converge uniformly to the unique solution of the problems. One example is included in the paper. Numerical computations of the example confirm our theoretical results. Recent results in the literature are extended and improved. (Received August 07, 2012)