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Christopher S. Goodrich* (cgoodrich@creightonprep.org), 7400 Western Ave., Omaha, NE 68114. *Coercive Nonlocal Elements in Fractional Differential Equations.*

I will discuss the use of coercive linear functionals in deducing existence results for fractional differential equations with nonlocal boundary conditions. As a specific example of this methodology, I will consider the fractional boundary value problem

$$\begin{aligned} -[D_{0+}^{\nu}y](t) &= \lambda f(t, y(t)), \quad 0 < t < 1 \\ y^{(i)}(0) &= 0, \quad 0 \leq i \leq n - 2 \\ [D_{0+}^{\alpha}y](1) &= H(\varphi(y)), \end{aligned}$$

where $n \in \mathbb{N}_4$, $n - 1 < \nu \leq n$, $\alpha \in [1, n - 2]$, and $\lambda > 0$ is a parameter. I will demonstrate that by utilizing a new order cone, one can generate existence results with minimal assumptions on the functions f and H . (Received September 24, 2018)