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Stephen Clark* (sclark@umr.edu), Department of Mathematics & Statistics, University of Missouri-Rolla, Rolla, MO 65409-0020, and **Johnny Henderson** (Johnny_Henderson@baylor.edu), Department of Mathematics, Baylor University, Waco, TX 76798-7328. *Optimal interval lengths for nonlocal boundary value problems associated with third order Lipschitz equations.*

For the third order differential equation, $y''' = f(x, y, y', y'')$, where $f(x, y_1, y_2, y_3)$ is Lipschitz continuous in terms of y_i , $i = 1, 2, 3$, optimal bounds are described for the length of intervals on which there exist unique solutions of certain nonlocal three and four point boundary value problems. These bounds are obtained through an application of the Pontryagin Maximum Principle from the theory of optimal control. (Received August 23, 2005)