Title: Positive solutions of fourth order problems with clamped beam boundary conditions

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Abstract: In this paper we make an exhaustive study of the fourth order linear operator u((4)) + M u coupled with the clamped beam conditions u(0) = u(1) = u'(0) = u'(1) = 0. We obtain the exact values on the real parameter M for which this operator satisfies an anti-maximum principle. Such a property is equivalent to the fact that the related Green's function is nonnegative in [0, 1] x [0, 1]. When M < 0 we obtain the best estimate by means of the spectral theory and for M > 0 we attain the optimal value by studying the oscillation properties of the solutions of the homogeneous equation u((4)) + M u = 0. By using the method of lower and upper solutions we deduce the existence of solutions for nonlinear problems coupled with this boundary conditions. (C) 2011 Elsevier Ltd. All rights reserved.

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