

**A BORDERLINE ANALYSIS
OF THE NEHARI MANIFOLD METHOD
FOR CONCAVE-CONVEX SYSTEM**

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ABSTRACT. The aim of this paper is to obtain an existence and multiplicity result for a strongly coupled concave-convex system for an *optimal* choice of involved real parameters via the Nehari manifold method. In the paper, we have obtained the parametric region which is optimal in the sense that the constraint minimization idea based on the Nehari manifold is no longer applicable if the parameters lie in the exterior of the optimal region. By applying a finer analysis of fibering maps, we have shown the existence of at least two positive solutions for the parameters lying below and even above the parametric optimal curve, characterized variationally via nonlinear generalized Rayleigh quotient. The main result of the paper is complemented by the study of the problem for negative parameter values.

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Key words and phrases. Nehari manifold; variational methods; extremal curve; concave-convex system.

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