Title: Optimal design for active damping in sandwich structures using the Direct MultiSearch method


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Abstract: This paper addresses the problem of optimal positioning of surface bonded piezoelectric patches in sandwich plates with viscoelastic core and laminated face layers. The objective is to maximize a set of modal loss factors for a given frequency range using multiobjective topology optimization. Active damping is introduced through co-located negative velocity feedback control. The multiobjective topology optimization problem is solved using the Direct MultiSearch Method. An application to a simply supported sandwich plate is presented with results for the maximization of the first six modal loss factors. The influence of the finite element mesh is analyzed and the results are, to some extent, compared with those obtained using alternative single objective optimization. (C) 2013 Elsevier Ltd. All rights reserved.

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