عنوان مقاله:

Shape Optimization of Slotted Steel Plate Dampers using the Simulated Annealing Algorithm

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خلاصه مقاله:

This paper reports a procedure for maximizing the energy dissipation capacity (EDC) of a slotted steel plater damper by changing its initial geometrical shape. The methodology uses a simulated annealing algorithm to iteratively vary the slots' disposition, number, and geometry while improving the EDC. This capacity is computed for each tested configuration from a finite element analysis in ABAQUS, considering a cyclic displacement protocol. Five initial sections are enhanced, with the optimal one evoking a sand clock shape with two symmetric slots. The EDC increment is higher than ۳۰۰%. It is observed that the objective function is multi-modal, and the optimal solution depends on the initial design. The proposed procedure is computationally easy to implement and requires less than fifty iterations to guarantee convergence in all cases.

کلمات کلیدی:

Metallic dampers, shape optimization, simulated annealing, slotted plates