

عنوان مقاله:

DESIGN OPTIMIZATION OF MOMENT FRAME STRUCTURES BASED ON NATURAL FREQUENCY CONSTRAINTS USING THE ADAPTIVE CHARGED SYSTEM SEARCH ALGORITHM

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خلاصه مقاله:

Natural frequencies of a structure give useful information about the structural response to dynamic loading. These frequencies should be far enough from the critical frequency range of dynamic excitations like earthquakes in order to prevent the resonance phenomenon sufficiently. Although there are many investigations on optimization of truss structures subjected to frequency constraints, just a few studies have been considered for optimal design of frame structures under these constraints. In this paper, a recently proposed metaheuristic algorithm called Adaptive Charged System Search (ACSS) is applied to optimal design of steel frame structures considering the frequency constraints. Benchmark design examples are solved with the ACSS, and optimization results are illustrated in terms of some statistical indices, convergence history and solution quality. The design examples include three planar steel frames with small to large number of design variables. Results show that the ACSS outperforms the charged system search algorithm in this sizing optimization problem.

کلمات کلیدی:

planar frames, frequency constraints, structural optimization, adaptive charged system search (ACSS), moment-resisting frames

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