عنوان مقاله:

OPTIMAL GROUND MOTION SCALING USING ENHANCED SWARM INTELLIGENCE FOR SIZING DESIGN OF STEEL FRAMES

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خلاصه مقاله:

Dynamic structural responses via time history analysis are highly dependent to characteristics of selected records as the seismic excitation. Ground motion scaling is a well-known solution to reduce such a dependency and increase reliability to the dynamic results. The present work, formulate a twofold problem for optimal spectral matching and performing consequent sizing optimization based on such scaled ground motion via numerical step-by-step analyses. Particle swarm optimization as a widely used meta-heuristic is specialized and improved to solve this problem treating a number of examples. The scaling error is evaluated using both traditional procedure and the developed method. In this regard, some issues are studied including the effect of structural period and shape of the design spectrum on the results. Contribution of the proposed enhancement on the standard particle swarm intelligence has improved its explorative capability resulting in higher efficiency of the algorithm.

کلمات کلیدی:

spectral matching, particle swarm optimization, time history analysis, sizing optimization, shear building.

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