

**OPTIMAL SPECTRAL MATCHING OF STRONG GROUND MOTION BY OPPOSITION-SWITCHING SEARCH**

**Mohsen Shahrouzi**

Kharazmi University, Iran  
*mesha140@yahoo.com*

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**Abstract:** Earthquakes are sources of seismic loading on structures with probabilistic nature of their records. As a result, no single earthquake is reliable for decision making in consequent structural design. A common solution to reduce such probabilistic effects is spectral matching of earthquake records with a target design spectrum within a prescribed period interval. Selection of the corresponding scale factors in such a process is formulated here as an optimization problem while the objective is to achieve the best compatibility of the mean spectrum with the target. A new algorithm is proposed here in after to solve this problem. It utilizes switching between movement of a candidate design vector and its bound-based opposite toward the current best solution. The algorithm is design for simplicity and efficiency for such a practical engineering task. Numerical tests exhibit considerable reduction of spectral matching error with respect to common practice in application of uniform scale factors.