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# Health Monitoring of LSF Structure via Novel TTFD Approach

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Lightweight Steel Framing (LSF) system has been proposed as an economic system and earthquake-resistant. Structural Health Monitoring (SHM) is as conservator for structure and monitor structure situation from stress and strain between different elements as continues. In this paper, a LSF building was modeled using Finite Element Method (FEM) which Modal and Time-history Analyses were utilized considering the effects of Near-field and Far-field earthquakes. Furthermore, three various Optimal Sensor Placement (OSP) algorithms were used and Genetic Algorithm (GA) was selected to act as the solution of the optimization formulation in the selection of the best sensor placement according to structural dynamic response of the LSF system. Results show that with a proper OSP method for SHM can detect weak points of structure in different parts and then can retrofit mentioned points.

Доклад. Конференция по мониторингу технического состояния гражданских сооружений (CSHM-4), «Системы мониторинга технического состояния сооружений, обеспечивающие продление срока службы сооружений». Ноябрь, 2012. Берлин. Германия.

### Ключевые слова:

Lightweight Steel Framing (LSF), Finite Element Method (FEM), Optimal Sensor Placement (OSP), Genetic Algorithm (GA), Near-field and far-field earthquakes.

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