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Dynamic Analysis of Steel Truss Bridges with Uncertain Parameters—A SABRA's Iron Bridge Case

Many structural mechanics problems are sufficiently well described by mathematical formulations. In reality, these processes may be very complex; the geometric and material parameters of structure and loads are uncertain. Such uncertainty may typically arise from imprecision during the process of manufacturing, construction, simplification for modeling, deterioration of structural elements or/and intensity of applied loads. If these parameters are bounded, the non-probabilistic interval approach is used to evaluate the structures' response. By combining the interval model of uncertainties with the finite element method, the analysis theory of static and dynamic upper and lower bounds is developed. The example of a static and seismic behavior of a steel truss bridge is analyzed by using this approach. This method illustrates the structural behavior variability by a non-single but bounded response. Thus, the engineer can evaluate the structural strength by the upper and lower bounds of responses.

Ключевые слова:

Содержание.

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