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An enhanced AMLS method and its performance. (English) Zbl 1425.65116
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Summary: In this paper, we present an effective new component mode synthesis (CMS) method based on the concept of the automated multi-level substructuring (AMLS) method. Herein, the original transformation matrix of the AMLS method is enhanced by considering the residual mode effect, and the resulting unknown eigenvalue in the formulation is approximated by employing the idea of the improved reduced system (IRS) method. Using the newly defined transformation matrix, we develop an enhanced AMLS method by which original finite element (FE) models can be more precisely approximated by reduced models, and their solution accuracy is significantly improved. The formulation details of the enhanced AMLS method is presented, and its accuracy and computational cost is investigated through numerical examples.

MSC:

65M60 Finite element, Rayleigh-Ritz and Galerkin methods for initial value Cited in 9 Documents
and initial-boundary value problems involving PDEs

Keywords:

structural dynamics; finite element method; model reduction; component mode synthesis; dynamic substructuring; AMLS method

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