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Some progress on parallel modal and vibration analysis using the JAUMIN framework.
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Summary: In the development of large and complex equipment, a large-scale finite element analysis (FEA) with high efficiency is often strongly required. This paper provides some progress on parallel solution of large-scale modal and vibration FE problems. Some predominant algorithms for modal and vibration analysis are firstly reviewed and studied. Based on the newly developed JAUMIN framework, the corresponding procedures are developed and integrated to form a parallel modal and vibration solution system; the details of parallel implementation are given. Numerical experiments are carried out to evaluate the parallel scalability of our procedures, and the results show that the maximum solution scale attains ninety million degrees of freedom (DOFs) and the maximum parallel CPU processors attain 8192 with favorable computing efficiency.

MSC:

[74S05](#) Finite element methods applied to problems in solid mechanics

[74H45](#) Vibrations in dynamical problems in solid mechanics

Software:

[IRAM](#); [JASMIN](#); [JAUMIN](#); [JDQR](#); [JDQZ](#); [PETS_c](#); [SIERRA](#); [SLEP_c](#)

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