

Convergence and accuracy of numerical methods in structural boundary problems

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SUMMARY

This paper describes a general procedure for proving the convergence and for the estimation of error of numerical solutions of boundary problems.

The basis of this procedure is the transformation of the discrete boundary problem into an equivalent discrete dynamic problem, which is, then, analyzed and the convergence and the error estimation are based upon the stability of its dynamic spectrum. Convergence obtained in this way is valid irrespective of applied load.

The procedure is developed for linear boundary problems, although the paper presents the methodology for its application to non-linear cases.

Several examples of boundary problems used to prove the liaison in this paper are taken from the linear and non-linear structural analyses. The applied numerical method is the finite element method, although any numerical method can be used.
