

Deformation Analysis of Thin Plate with Distributed Thermal Bending Load by Triple-Reciprocity BEM

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Keywords: Boundary Element Method, Shell Structure, Thin Plate, Thermal Stress, Computational Mechanics

In general, internal cells are required to solve the deformation of a thin plate with an arbitrary distributed thermal bending load using a conventional boundary element method (BEM). However, in this case, the merit of the BEM, which is the easy preparation of data, is lost. In this paper, it is shown that the deformation analysis of a thin plate with an arbitrary distributed thermal bending load can be solved without the use of internal cells by using the triple-reciprocity boundary element method. The distribution of the arbitrary thermal bending load is interpolated using boundary integral equations. The problem of the thin plate in accordance with Kirchhoff's theory is formulated using two coupled Poisson equations that are expressed in integral form using the second theorem of Green in the classical manner. A new computer program was developed and applied to several problems.