MONOGRAPHS

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Three-Dimensional Problems of Plates Theory in Temperature Field

(with V.A. Krysko and M.P. Misnik)
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monograph, 190 pages, in Polish

SUMMARY

[Preface & Contents]

[Book Review]

This monograph belongs to the series yielded as a result of cooperation between the Technical University of Lodz (Poland) and The National University of Saratov (Russia) and devoted to the analysis of plates and shells. The majority of the books from this series has been published by Wydawnictwo Naukowo-Techniczne - Fundacja "Książka Naukowo-Techniczna".

In Chapter 1 of this monograph, a general three-dimensional problem of thermoelasticity of a parallelepiped is formulated. Among others, a rigorous mathematical approach to an error estimation analysis and stability of the used difference schemes is addressed.

Chapter 2 is devoted to description of various methods used to solve elliptic, parabolic and hyperbolic equations. In addition, a reliability of the obtained results is illustrated and discussed and also some numerical examples are given.

Chapter 3 includes numerical analysis of some chosen linear problems of three-dimensional theory of plates. The following problems are considered: static and dynamic, non-stationary heat problems with sources situated inside a plate, solutions to the problems describing non-isotermic processes in statics of plates, influence of internal heat sources on a stress-strain state of a plate and influence of coupling between deformation and temperature on a plate behaviour.

Chapter 4 is focused on temperature and deformation fields analysis including physical type nonlinearities. After derivation of differential equations and difference approximation within theory of small elastic-plastic deformations, influence of coupling between temperature and deformation on the stress-strain state is carried out.

The monograph is meant for students, researchers within the fields of mechanics, physics and applied mathematics dealing both with theory of plates and analysis of partial differential and difference equations.