Some Problems and Analysis for Thermal Bending Plates

by

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Faculty of Science and Technology

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Supervisor

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Abstract

Thermal plates are employed in many engineering systems, such as space shuttle, aircrafts, solar energy systems, mechanical systems, civil engineering structures, some components in micro-electro and electronic systems, and so on. In recent years, with the development of materials, thermal plates have been paid more and more attentions. Hence the analyses on various thermal plates have attracted many researchers since the early of 20th century.

In order to obtain the analytical solutions for various thermal bending plates, many researchers are involved in the investigation. They simulate the solution procedure for the plates acted by normal forces to analyze the thermal bending plates. We found that the solutions obtained in this way could not fulfill the boundary conditions, and hence they are not correct solutions which can be found in vast number of published papers. The problems in the two conventional analytical solutions are discussed. Finite element analysis is conducted to further verify this conclusion. The challenge problems in finite element analysis are also figured out.

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