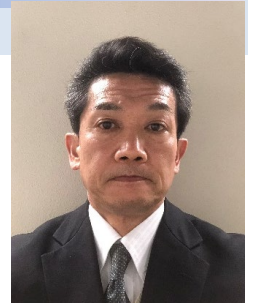


Development of highly accurate structural analysis methods for composite structures



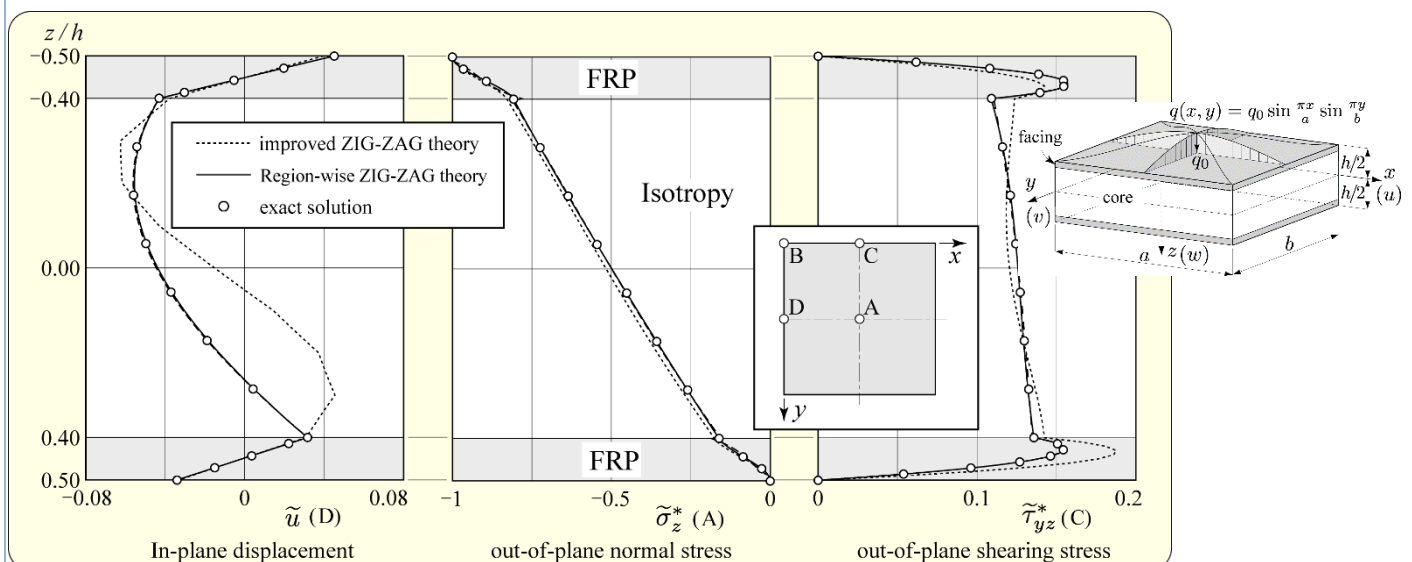
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Keywords	composite materials, zig-zag theory, hierarchical finite element method		
Technical Support Skills	Structural Analysis of Composite Structures Structural Analysis of Composite Materials Structural analysis of sandwich structures		

Research Contents

In recent years, composite materials such as fiber-reinforced plastics (FRP) have been widely used as construction materials for structures in Japan. In particular, FRP is increasingly used in adhesive bonding methods to reinforce existing steel and concrete structures with FRP. However, in anisotropic laminated structures such as FRP, the effect of ZIG-ZAG displacement becomes significant as the plate thickness ratio increases, and the conventional equivalent single-layer theory becomes inaccurate even if higher-order theory is used.

For accurate structural analysis of steel and concrete structures reinforced with composite materials, we are developing structural analysis theories such as the improved ZIG-ZAG theory. Region-wise ZIG-ZAG theory, which is a combined of the improved ZIG-ZAG theory and layer-wise theory, has been developed to apply the improved ZIG-ZAG theory to delamination analysis and sandwich structures consisting of composites and isotropic materials. Furthermore, a Hierarchical Finite Element Method based on the Region-wise ZIG-ZAG theory is being developed.

[Example: Three-dimensional stress analysis of sandwich plates]



Available Facilities and Equipment

ANSYS ED.	