

INTRA-STRINGER BUCKLING ANALYSIS OF COMPOSITE STIFFENED PANELS S19.1 A350XWB

INTRODUCTION

ICEMM has participated in different analysis of the section S19.1 of the A350XWB aircraft. In this project, a study of non-linear buckling and postbuckling of stiffness skin panels under circumferential load has been carried out, and the influence of the panel curvature on buckling has been evaluated.

COMPLETED PROJECT

Client: ALESTIS

Date: 2010

- Intra-stringer buckling analysis of composite stiffness panels S19.1 A350XWB

COMPLETED ACTIVITIES

- FEM model
- Materials: composite material
- Linear buckling analysis
- Non-linear buckling analysis
 1. First buckling mode
 2. Postbuckling
- Sensitivity to panel curvature
- Effective width of the panel
- Documentation

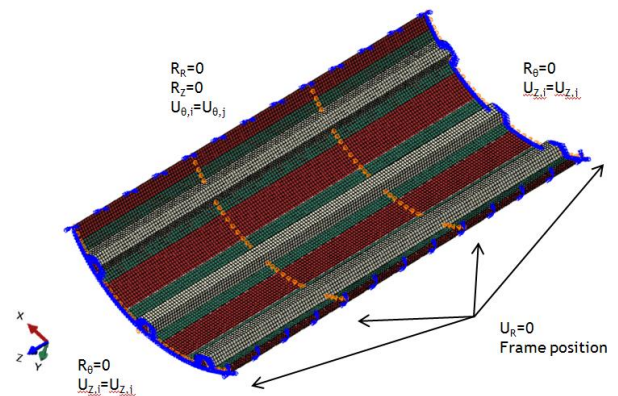


Figure 1. Panel boundary conditions

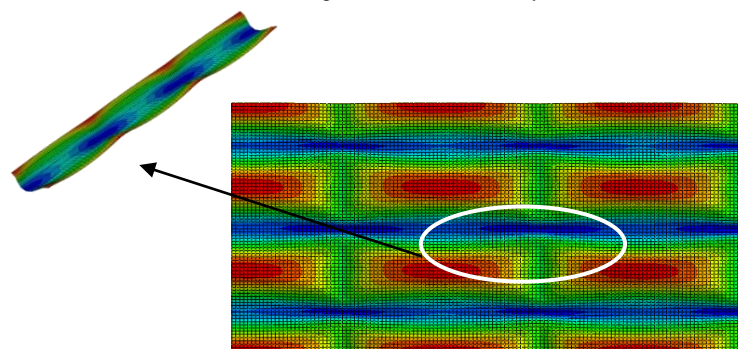


Figure 2. 1st failure mode

TECHNOLOGY

All the project has been analyzed with the Finite Element Solver tool ABAQUS version 6.10.2 Windows Platform and the pre/post processing has been carried out with ABAQUS CAE.

- Linear buckling
- Linear buckling with preload
- Non-linear buckling analysis and postbuckling
- Buckling mode identification

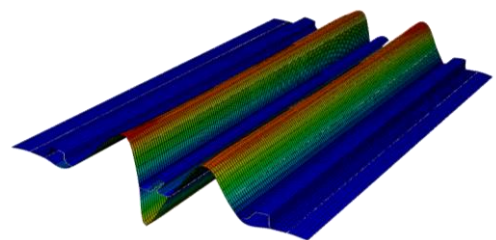


Figure 3. Intra-stringer strip mode analysis