Structural analysis of Composite Fan blade

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Abstract

The purpose of aFJR project is to advance research on jet engine component technologies so that Japanese manufacturers can join more effectively in international joint-development projects on next-generation jet engines. The technology of the weight reduction of composite fan blade is researched in the aFJR project.

http://www.aero.jaxa.jp/eng/research/ecat/afjr/

Reasons for using of JSS2

The hollow composite fan blade was designed based on the bird strike simulation results using JSS2.

Achievements of the Year

Figure 1 shows the analysis result of the bird strike simulation of hollow composite fan blade. The dynamic behavior of fan blade and the strain time histories were very close to those of the demonstration test result.

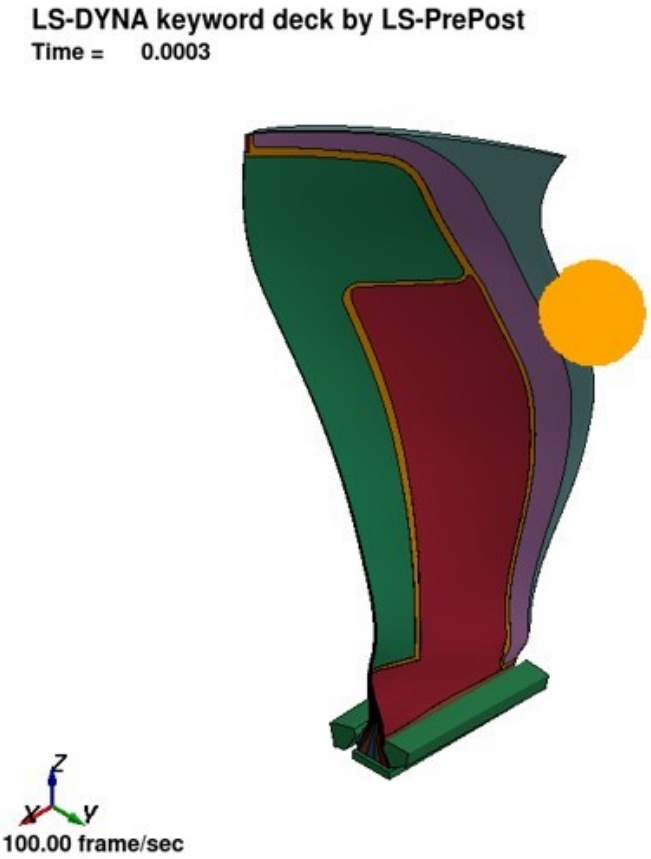

Fig.1 The bird strike simulation of hollow composite fan blade (a) t = 0.3 ms

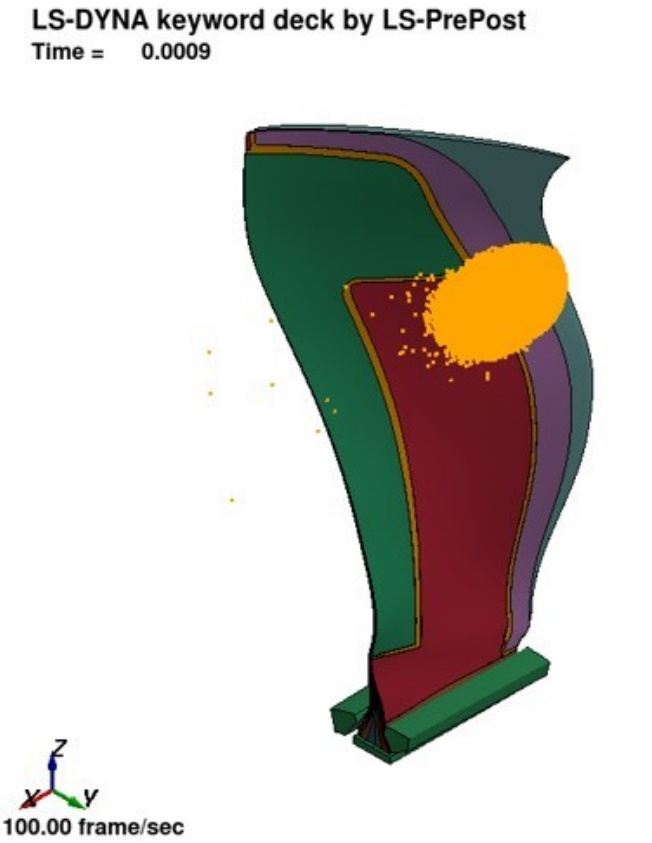

Fig.2 The bird strike simulation of hollow composite fan blade (b) t = 0.9 ms

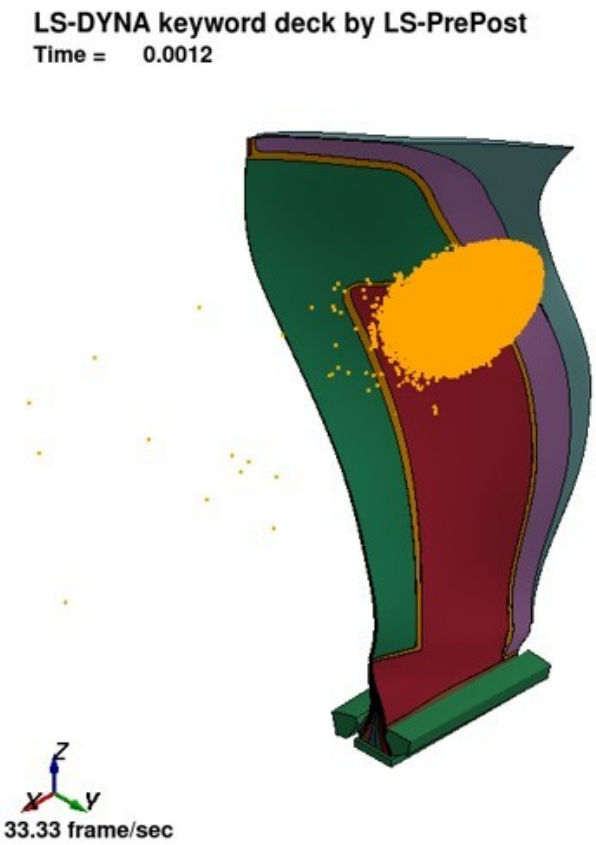

Fig.3 The bird strike simulation of hollow composite fan blade (c) t = 1.2 ms

Publications

N/A

Usage of JSS2

Computational Information

Parallelization Methods	MPI
Thread Parallelization Methods	OpenMP
Number of Processes	128
Elapsed Time per Case	50.00 hours

Resources Used

Fraction of Usage in Total Resources*1 (%): 0.20

Details

Computing Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2 (%)
SORA-MA	1,364,797.48	0.18
SORA-PP	0.00	0.00
SORA-LM	0.00	0.00
SORA-TPP	0.00	0.00

File System Resources		
File System Name	Storage assigned(GiB)	Fraction of Usage*2 (%)
/home	182.79	0.13
/data	56,745.24	1.05
/ltmp	5,533.86	0.42

Archiver Resources		
Archiver System Name	Storage used(TiB)	Fraction of Usage*2 (%)
J-SPACE	6.93	0.29

*1 Fraction of Usage in Total Resources: Weighted average of three resource types (computing, file system, and archiver)

*2 Fraction of Usage: Percentage of usage relative to each resource used in one year