

Research on aircraft cabin noise reduction

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● Abstract

This research focuses on the development of our cabin noise prediction tool using the Finite-Difference Time-Domain method, and in-flight noise measurement in the JAXA's Jet-Flying Test Bed (FTB) "HISHO" with the aim of grasping the cabin noise characteristics.

● Reasons and benefits of using JAXA Supercomputer System

JSS was used to conduct the simulation of our cabin noise prediction method (FDTD), which needs the resource of JSS to deal with a large computational domain.

● Achievements of the Year

Through numerical analysis, the authors designed a vibration damping device and completed fabrication of the device using resin and metal. The coupon test results showed that vibration and sound insulation effects were achieved in the target frequency band. Furthermore, by tuning the device to the natural frequency of the damping target in a wind test simulating actual machine conditions, the authors achieved a sound insulation effect that exceeded the target value. In addition, the numerical analysis enabled us to quantitatively reproduce the vibration characteristics in the coupon test.

● Publications

N/A

● **Usage of JSS**

● **Computational Information**

Process Parallelization Methods	N/A
Thread Parallelization Methods	N/A
Number of Processes	1
Elapsed Time per Case	5 Minute(s)

● **JSS3 Resources Used**

Fraction of Usage in Total Resources*1(%): 0.00

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage *2(%)
TOKI-SORA	1,757.12	0.00
TOKI-ST	3,839.10	0.00
TOKI-GP	0.00	0.00
TOKI-XM	0.00	0.00
TOKI-LM	0.00	0.00
TOKI-TST	0.00	0.00
TOKI-TGP	0.00	0.00
TOKI-TLM	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2 (%)
/home	81.67	0.07
/data and /data2	5,103.33	0.03
/ssd	0.00	0.00

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2 (%)
J-SPACE	0.00	0.00

*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.

● **ISV Software Licenses Used**

ISV Software Licenses Resources		
	ISV Software Licenses Used (Hours)	Fraction of Usage*2 (%)
ISV Software Licenses (Total)	0.00	0.00

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