

## Robust design for Jet Engine/Analyses of Unsteady phenomena

Report Number: R24EDA201C51

Subject Category: Aeronautical Technology

URL: <https://www.jss.jaxa.jp/en/ar/e2024/26774/>

### Responsible Representative

Atsushi Kanda, Aviation Technology Directorate, Aviation Environmental Sustainability Innovation Hub

### Contact Information

Junichi Kazawa, Aeronautical Technology Directorate, Aviation Environmental Sustainability Innovation Hub(kazawa.junichi@jaxa.jp)

### Members

Takafumi Kanayama, Kenshi Yamashita

### Abstract

Clarify the mechanism of unsteady flow phenomena that occur in compressor blade rows.

### Reasons and benefits of using JAXA Supercomputer System

The unsteady analyses of multi-stage annular compressor will be very large for satisfactory results. So we can not be calculated in a realistic time using anything other than JSS.

### Achievements of the Year

The unsteady flow phenomena that occurred in the rig test can be simulated by numerical analysis, and by analyzing the time-series data obtained, the mechanism of the unsteady flow phenomena that occurred in the rig test were identified.

### Publications

N/A

### Usage of JSS

#### Computational Information

Process Parallelization Methods	MPI
Thread Parallelization Methods	N/A
Number of Processes	137 - 3888
Elapsed Time per Case	1080 Hour(s)

- **JSS3 Resources Used**

Fraction of Usage in Total Resources\*<sup>1</sup>(%): 1.31

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage* <sup>2</sup> (%)
TOKI-SORA	30,288,393.27	1.39
TOKI-ST	1,635,813.72	1.68
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* <sup>2</sup> (%)
/home	1,024.00	0.69
/data and /data2	106,774.29	0.51
/ssd	0.00	0.00

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage* <sup>2</sup> (%)
J-SPACE	8.28	0.03

\*<sup>1</sup>: Fraction of Usage in Total Resources: Weighted average of three resource types (Computing, File System, and Archiver).

\*<sup>2</sup>: 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 <sup>*2</sup> (%)
ISV Software Licenses (Total)	1,424.38	0.97

<sup>\*2</sup>: Fraction of Usage : Percentage of usage relative to each resource used in one year.