

**high-fidelity analysis tools development for aerodynamic cascade design /
Compressor aerodynamic performance prediction**

Report Number: R23EDA101P11

Subject Category: Aeronautical Technology

URL: <https://www.jss.jaxa.jp/en/ar/e2023/23675/>

● **Responsible Representative**

Tatsuya Ishii, 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**

Junichi Kazawa, Takafumi Kanayama

● **Abstract**

It contributes to the design of jet engines by improving the accuracy of stall point prediction in numerical analysis in multi-stage compressor blade rows.

● **Reasons and benefits of using JAXA Supercomputer System**

The number of cases of aerodynamic performance prediction of a multi-stage 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**

Various turbulence models were used to analyze four-stage rig test, and a comparison was made between the calculation results and the test results.

● **Publications**

N/A

● **Usage of JSS**

● **Computational Information**

Process Parallelization Methods	MPI
Thread Parallelization Methods	N/A
Number of Processes	126 - 144
Elapsed Time per Case	5 Hour(s)

● **JSS3 Resources Used**

Fraction of Usage in Total Resources*1(%): 0.28

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage*2(%)
TOKI-SORA	359,425.81	0.02
TOKI-ST	2,001,916.39	2.16
TOKI-GP	0.00	0.00
TOKI-XM	0.00	0.00
TOKI-LM	21.87	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	3.46	0.00
/data and /data2	1,177.69	0.01
/ssd	193.08	0.02

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)	2,413.21	1.09

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