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

● **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**

Numerical results were compared with the 4-stage rig test results.

● **Publications**

N/A

● **Usage of JSS**

● **Computational Information**

Process Parallelization Methods	MPI
Thread Parallelization Methods	OpenMP
Number of Processes	103 - 143
Elapsed Time per Case	17372 Second(s)

● **JSS3 Resources Used**

Fraction of Usage in Total Resources[*1](%): 0.79

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage[*2](%)
TOKI-SORA	0.00	0.00
TOKI-ST	5,364,292.32	6.61
TOKI-GP	0.00	0.00
TOKI-XM	0.00	0.00
TOKI-LM	86.68	0.01
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	20.57	0.02
/data and /data2	9,716.82	0.10
/ssd	486.59	0.13

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage[*2](%)
J-SPACE	1.84	0.01

[*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)	2,063.50	1.45

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