high-fidelity analysis tools development for aerodynamic cascade design / Unsteady analyses of Compressor

● **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, Kenshi Yamashita

● **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 unsteady analyses 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**

A full stage and full circumference unsteady analysis was performed to simulate rotating stall in the compressor cascade and investigate its mechanism.

● **Publications**

N/A

● **Usage of JSS**

● **Computational Information**

Process Parallelization Methods	MPI
Thread Parallelization Methods	N/A
Number of Processes	36 - 1152
Elapsed Time per Case	2000 Hour(s)

● **JSS3 Resources Used**

Fraction of Usage in Total Resources[1](%): 1.67

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage[2](%)
TOKI-SORA	16,594,404.93	0.75
TOKI-ST	8,383,487.23	9.05
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	3.46	0.00
/data and /data2	7,301.69	0.05
/ssd	193.08	0.02

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage[2] (%)
J-SPACE	11.38	0.04

[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)	337.39	0.15

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

● **ISV Software Licenses Used**