

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

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● 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 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(%): 2.63

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage*2(%)
TOKI-SORA	39,446,111.51	1.72
TOKI-ST	9,464,976.24	9.46
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	5.70	0.01
/data and /data2	7,281.78	0.06
/ssd	209.63	0.03

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2 (%)
J-SPACE	9.25	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)	269.87	0.19

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