

**Research on supersonic heat-resistant fans**

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Subject Category: Space and Astronautical Science

URL: <https://www.jss.jaxa.jp/en/ar/e2024/27098/>**Responsible Representative**

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**Abstract**

Design a supersonic fan rotor blade of precompression airfoil type, achieving a pressure ratio of 2 or more in a single stage

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

The design calculation of fan blades with complex geometry required the computing power and numerical tools of JAXA's supercomputer.

**Achievements of the Year**

The aerodynamic shapes of the supersonic fan rotating blade stage and static blade stage of the precompression airfoil type that achieves a pressure ratio of 2 or higher in a single stage were determined, and CFD analysis confirmed that the target efficiency performance could be obtained.

**Publications**

N/A

**Usage of JSS****Computational Information**

Process Parallelization Methods	N/A
Thread Parallelization Methods	N/A
Number of Processes	1
Elapsed Time per Case	6 Hour(s)

- **JSS3 Resources Used**

Fraction of Usage in Total Resources\*1(%): 0.00

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage*2(%)
TOKI-SORA	3,270.63	0.00
TOKI-ST	45.08	0.00
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	0.00	0.00
/data and /data2	30,620.00	0.15
/ssd	0.00	0.00

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 <sup>*2</sup> (%)
ISV Software Licenses (Total)	13.00	0.01

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