

Next generation jet engine technology - development of high efficiency compressor design technology and aerodynamic performance prediction -

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● **Abstract**

We will develop aerodynamic performance improvement technology and high precision aerodynamic performance prediction technology for multistage-compressor assuming an increase in relative tip clearance, corresponding to a small core engine applied to an ultra-high bypass ratio engine.

● **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 JSS2.

● **Achievements of the Year**

The analysis including non-design points was performed for the two-stage compressor rig, and the accuracy of the numerical analysis program was confirmed. In addition, the effect of enlarging the operating range by casing treatment was confirmed using an overset grid method.

● **Publications**

N/A

- Usage of JSS2

- Computational Information

Process Parallelization Methods	MPI
Thread Parallelization Methods	Automatic Parallelization
Number of Processes	64 - 128
Elapsed Time per Case	100 Hour(s)

- Resources Used

Fraction of Usage in Total Resources*1(%): 0.89

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2(%)
SORA-MA	4,029,838.62	0.49
SORA-PP	1,230,490.53	7.97
SORA-LM	36.46	0.02
SORA-TPP	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2(%)
/home	22.75	0.02
/data	11,773.37	0.20
/ltmp	4,660.09	0.40

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2(%)
J-SPACE	1.83	0.05

*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.