

Advanced simulation of internal flow in rotating machinery

Report Number: R21EDA201P11

Subject Category: Aeronautical Technology

URL: <https://www.jss.jaxa.jp/en/ar/e2021/18467/>

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● Abstract

In order to improve the accuracy of predicting the aerodynamic performance of the rotating machine by numerical simulation, comparison with known data will be performed.

● Reasons and benefits of using JAXA Supercomputer System

Necessary for quick case studies.

● Achievements of the Year

Verification was conducted on NASA Rotor37 and Rotor67, and it was confirmed that there was no problem with the prediction accuracy.

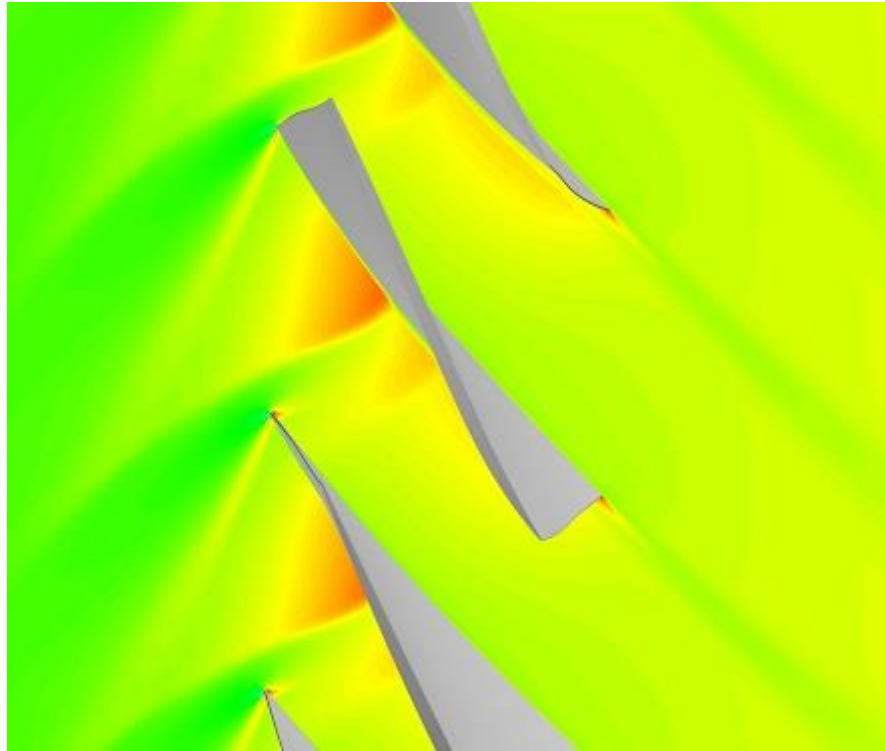


Fig. 1: Mach Number Dstribution (Rotor67)

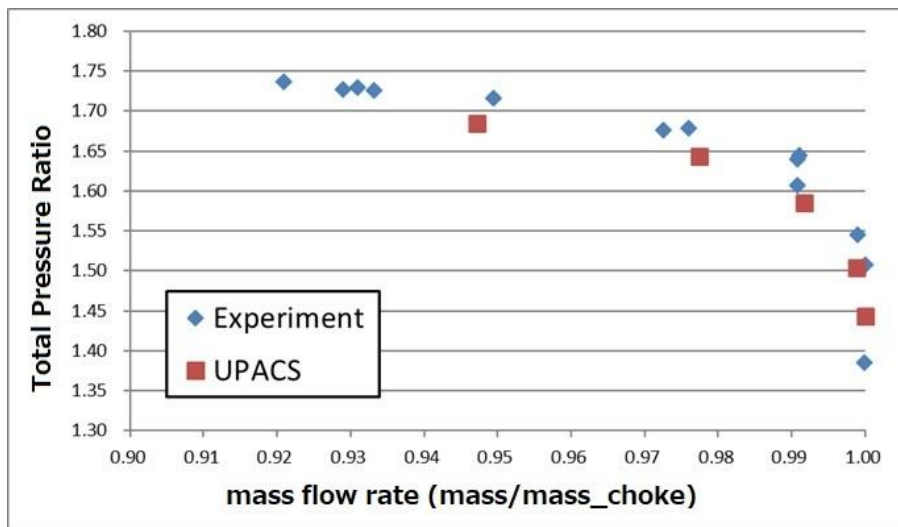


Fig. 2: Performance Map (Rotor67)

- **Publications**

N/A

- **Usage of JSS**

- **Computational Information**

Process Parallelization Methods	MPI
Thread Parallelization Methods	Automatic Parallelization
Number of Processes	9
Elapsed Time per Case	20 Hour(s)

- **JSS3 Resources Used**

Fraction of Usage in Total Resources*1(%): 0.06

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage*2(%)
TOKI-SORA	123,967.31	0.01
TOKI-ST	373,958.50	0.46
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	21.09	0.02
/data and /data2	6,029.09	0.06
/ssd	997.45	0.26

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2(%)
J-SPACE	23.35	0.16

*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)	20.20	0.01

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