

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 for using JSS2**

Prediction of multistage compressor aerodynamic performance and the resolved-LES implemented to obtain detailed knowledge about the loss of the blades can not be calculated in a realistic time other than JSS2.

● **Achievements of the Year**

Calculations by resolved-LES was performed using published data. It was confirmed that the obtained results by numerical simulation were in good agreement with the experimental results at the design point. At the off-design point, the experimental results and the numerical results are largely different, so we plan to extract issues and improve the prediction accuracy.

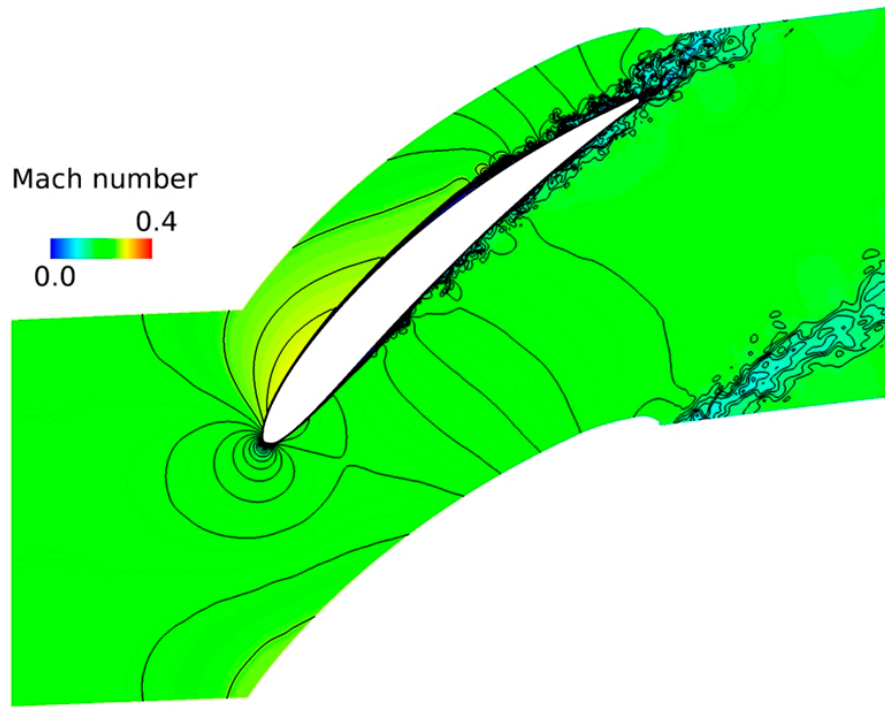


Fig. 1: Mach Number Distribution in Design Point

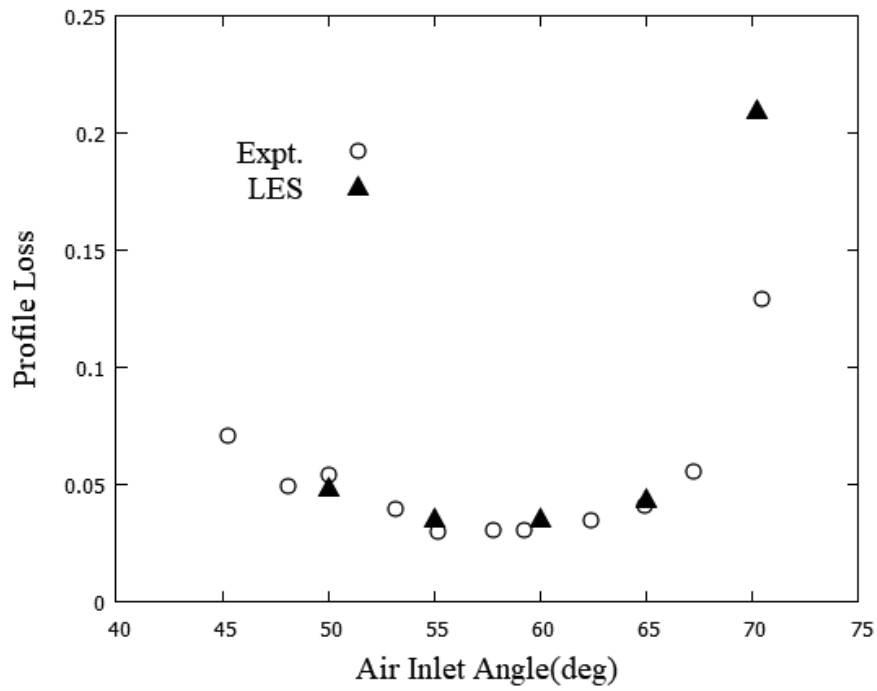


Fig. 2: Calculated Profile Loss Coefficient from resolved-LES

● Publications

N/A

● Usage of JSS2

● Computational Information

Process Parallelization Methods	MPI
Thread Parallelization Methods	Automatic Parallelization
Number of Processes	768 - 1536
Elapsed Time per Case	90 Hour (s)

● Resources Used

Fraction of Usage in Total Resources*1 (%): 0.58

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2 (%)
SORA-MA	1,282,996.52	0.16
SORA-PP	748,430.83	5.98
SORA-LM	0.00	0.00
SORA-TPP	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2 (%)
/home	22.89	0.02
/data	2,104.44	0.04
/ltmp	4,687.50	0.40

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2 (%)
J-SPACE	0.16	0.01

*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.