

Development of FaSTAR-Move

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● Abstract

FaSTAR-Move, an extended version of the fast unstructured-grid flow solver FaSTAR, is developed to analyse flow field around moving/deforming objects such as external store separation, flutter, rotor, and compressor/turbine of aero-engines.

● Reasons and benefits of using JAXA Supercomputer System

JSS is necessary to complete numerical simulations of unsteady phenomena and to understand it in short time span.

● Achievements of the Year

FaSTAR-Move have been extended to enable rotor-stator analysis for turbine and rotor/body interaction analysis for helicopter. It was confirmed that FaSTAR-Move can reasonably simulate the flow field around them.

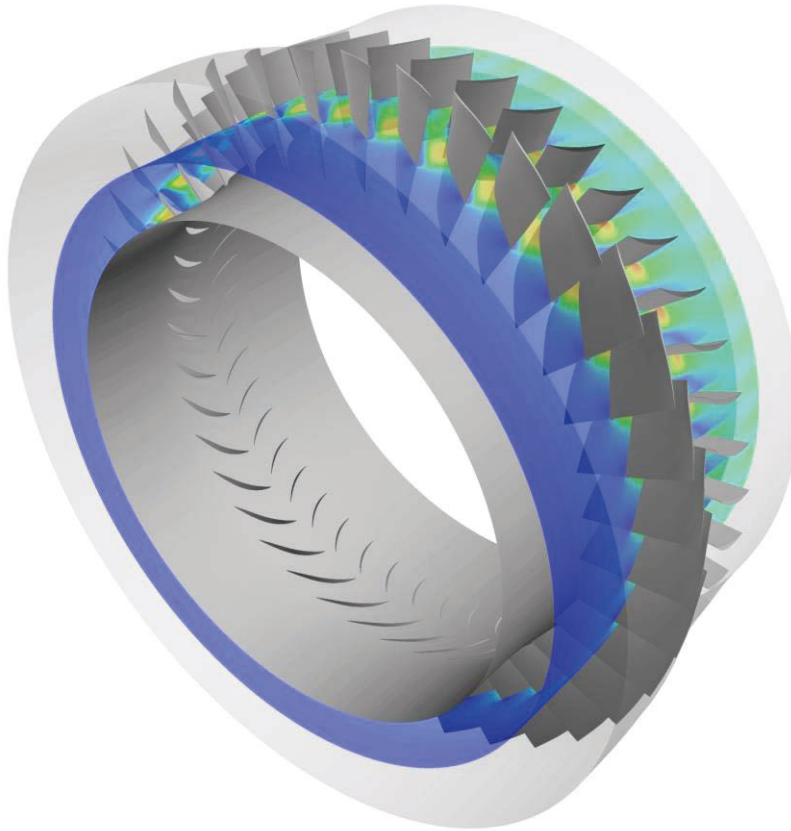


Fig. 1: Mach number contours for flow around Stage 37.

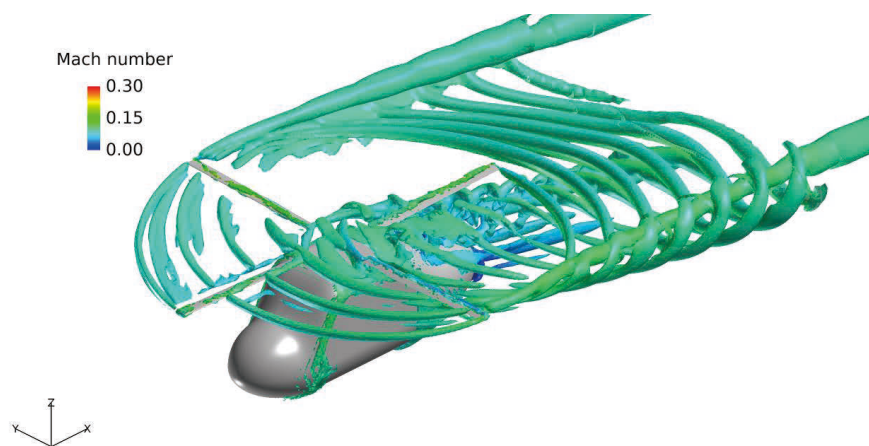


Fig. 2: Q-criteria of the rotor/body interaction analysis for helicopter.

● Publications

N/A

● Usage of JSS2

● Computational Information

Process Parallelization Methods	MPI
Thread Parallelization Methods	N/A
Number of Processes	256 - 2048
Elapsed Time per Case	200 Hour(s)

● Resources Used

Fraction of Usage in Total Resources*1(%): 0.95

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2(%)
SORA-MA	7,875,523.31	0.96
SORA-PP	74,469.64	0.48
SORA-LM	4,700.01	1.96
SORA-TPP	2,972.28	0.18

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2(%)
/home	979.70	0.82
/data	79,206.55	1.36
/ltmp	5,732.20	0.49

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2(%)
J-SPACE	5.74	0.14

*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.