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 for using JSS2

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

Achievements of the Year

FaSTAR-Move was extended to enable analysis for aero-engine blades and helicopter rotor blades. It was comfirmed that FaSTAR-Move can reasonably simulate the flow field around them.

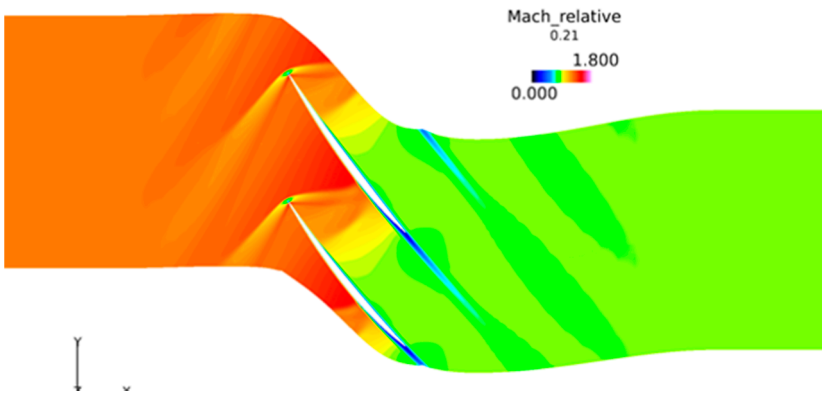

Fig. 1: Mach number contors for flow around turbine blades

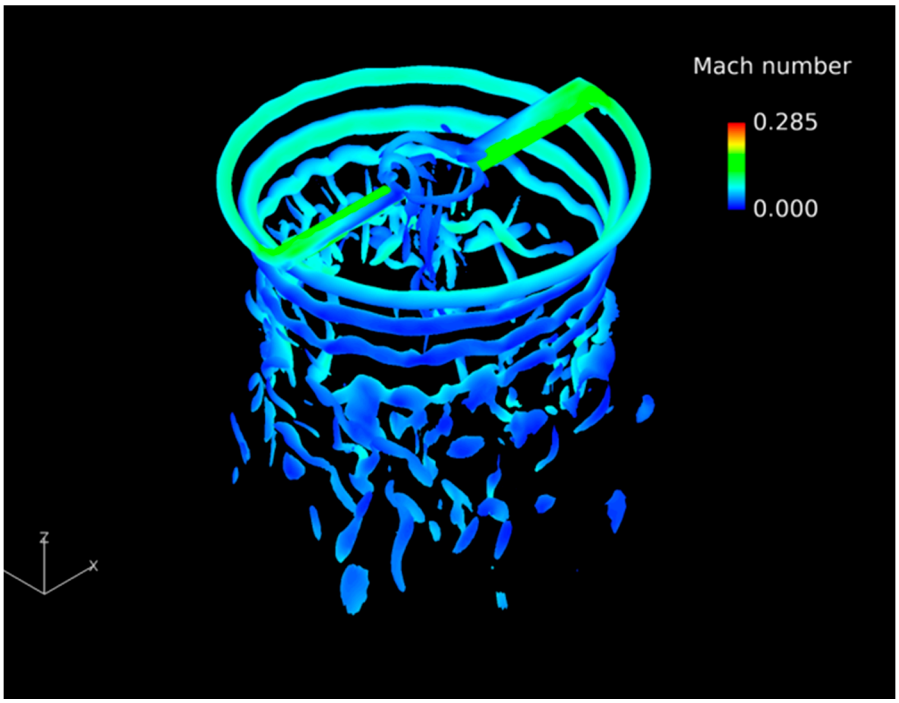

Fig. 2: Mach number contors for flow around helicopter rotor

Publications

N/A

Usage of JSS2

Computational Information

Process Parallelization Methods	MPI
Thread Parallelization Methods	N/A
Number of Processes	128 - 512
Elapsed Time per Case	180 Hour (s)

Resources Used

Fraction of Usage in Total Resources[*1] (%): 0.29

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2 (%)
SORA-MA	1,281,338.41	0.16
SORA-PP	194,605.58	1.56
SORA-LM	676.98	0.32
SORA-TPP	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2 (%)
/home	711.65	0.74
/data	48,338.30	0.85
/ltmp	5,570.94	0.48

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2 (%)
J-SPACE	3.00	0.11

*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.