

Detection of origination for 3D unsteady aerodynamic phenomena (AEROSENS)

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● Abstract

Unsteady CFD analysis will be performed in order to detect the starting point of buffet phenomena utilizing data mining techniques.

● Reasons for using JSS2

A large-scale parallel computer such as JSS2 is indispensable for large-scale 3D NS analysis to acquire unsteady numerical simulations.

● Achievements of the Year

Zonal DES (ZDES) Analysis for several angle of attack conditions have been performed (Fig. 1 and 2). Data mining techniques for detecting places that might effect to the shock oscillation have been developed using obtained ZDES results.

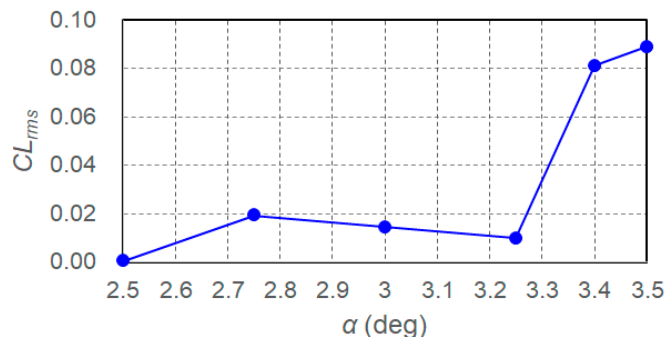


Fig. 1: Buffet on-set boundary determined by CL_{rms}

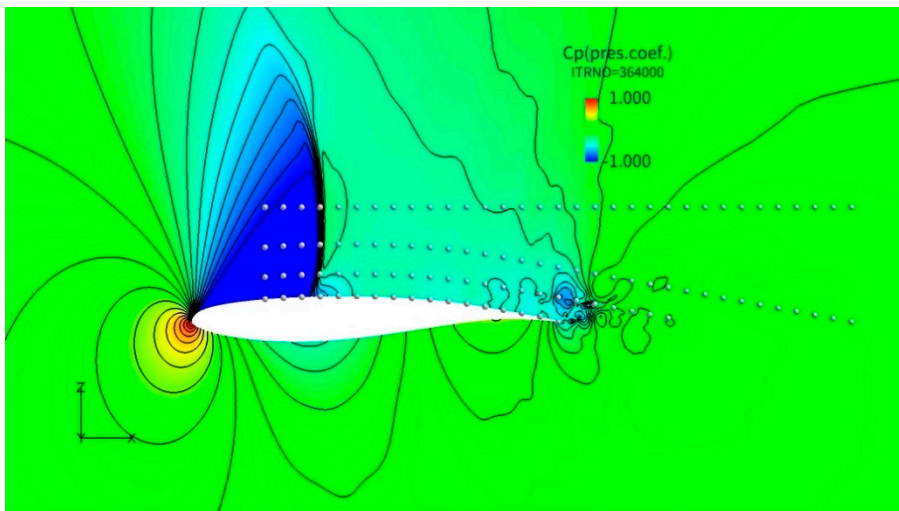


Fig. 2: ZDES results for OAT15A type airfoil
(Video. Video is available on the web.)

● **Publications**

N/A

● **Usage of JSS2**

● **Computational Information**

Process Parallelization Methods	MPI
Thread Parallelization Methods	N/A
Number of Processes	512
Elapsed Time per Case	120 Hour (s)

● **Resources Used**

Fraction of Usage in Total Resources*1 (%): 0.50

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2 (%)
SORA-MA	4,360,052.50	0.53
SORA-PP	46,984.41	0.38
SORA-LM	444.16	0.21
SORA-TPP	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2 (%)
/home	86.11	0.09
/data	2,767.69	0.05
/ltmp	1,669.34	0.14

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2 (%)
J-SPACE	0.06	0.00

*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.