

System Operation of the Digital/Analog-Hybrid Wind Tunnel (DAHWIN)

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● Abstract

Through the operation of the JAXA Digital/Analog-Hybrid Wind Tunnel (DAHWIN), we aim to realize complementary use of Experimental Fluid Dynamics (EFD) and Computational Fluid Dynamics (CFD). Specifically, a series of DAHWIN functions (e.g. CFD before wind tunnel testing, test preparation using pre-CFD data, real time EFD/CFD data monitoring, and EFD/CFD data integration) are served to users.

Ref. URL: <http://www.aero.jaxa.jp/eng/research/basic/aerodynamic/dahwin/>

● Reasons for using JSS2

DAHWIN requires a number of high-fidelity and large-scaled computations (3D RANS analysis) based on the JAXA 2m x 2m transonic wind tunnel testing, and needs to use the supercomputer.

● Achievements of the Year

For the CFD analysis using DAHWIN, the system was applied to a total of 8 JAXA 2m x 2m transonic wind tunnel tests and functions including test preparation using pre-CFD data and real time EFD/CFD data monitoring were utilized.



Fig. 1: EFD/CFD real time data monitoring using DAHWIN

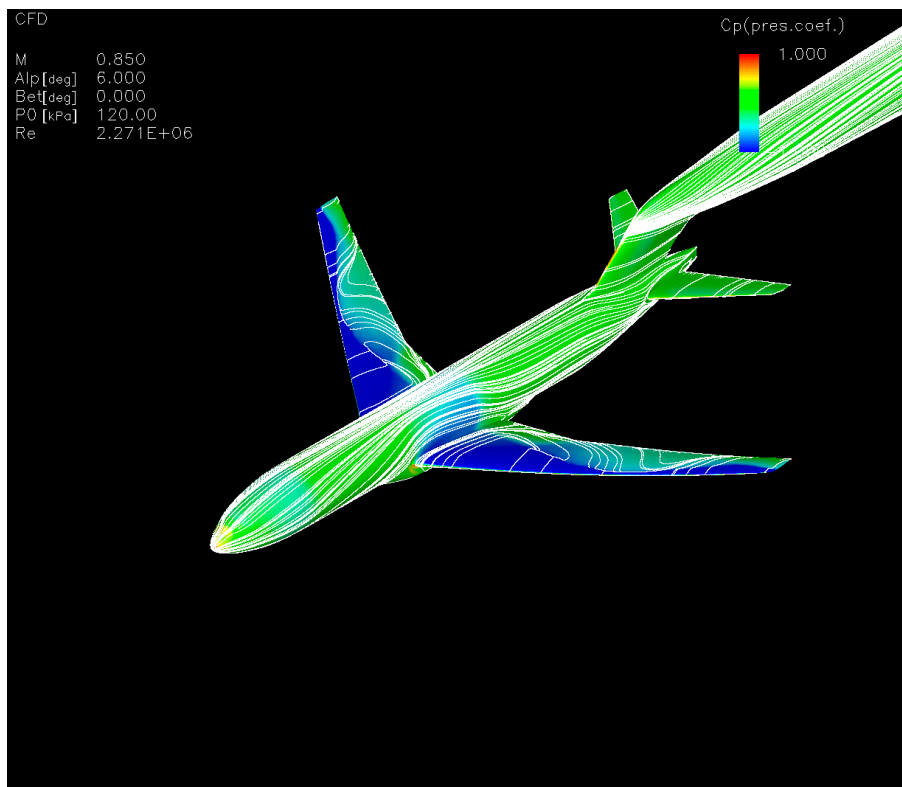


Fig. 2: Display of pre-CFD result at monitoring

● Publications

N/A

● Usage of JSS2

● Computational Information

Process Parallelization Methods	MPI
Thread Parallelization Methods	Automatic Parallelization
Number of Processes	512
Elapsed Time per Case	30 Minute (s)

● Resources Used

Fraction of Usage in Total Resources*1 (%): 0.02

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2 (%)
SORA-MA	18,547.99	0.00
SORA-PP	1,469.06	0.01
SORA-LM	24.75	0.01
SORA-TPP	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2 (%)
/home	647.46	0.67
/data	22,115.53	0.39
/ltmp	7,268.30	0.62

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2 (%)
J-SPACE	0.58	0.02

*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.