Multiobjective design exploration for Aerodynamic Optimization

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● **Abstract**

Kyushu Institute of Technology has been studying a fully reusable space transportation system using winged rocket called WIRES (WInged REusable Sounding rocket). One of the objectives of this project is to design optimized airfoil of the winged rocket using evolutionary algorithms associated with computational fluid dynamics.

● **Reasons for using of JSS2**

An enormous number of airfoils should be evaluated for optimization. It will be a nontrivial problem for a workstation at our resource. Therefore, calculation cost reduction using JSS2 is desired.

● **Achievements of the Year**

In this fiscal year, we planned to describe the optimization algorithm and carry out the multi-objective optimization for airfoils using JSS2 which can maintain the high angles of attack at re-entry phase and have a good lift-to-drag ratio. However, due to the delay in development, we only made calculations using　a small scale workstations.

● **Publications**

N/A

🔵 Usage of JSS2

● Computational Information

Parallelization Methods	N/A
Thread Parallelization Methods	N/A
Number of Processes	1
Elapsed Time per Case	1.00 hours

● Resources Used

Fraction of Usage in Total Resources*1 (%): 0.01

Details

Computing Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2 (%)
SORA-MA	0.36	0.00
SORA-PP	0.03	0.00
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	095.37	0.07
/data	572.20	0.01
/ltmp	11,718.76	0.88

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