

Conceptual Study of Reusable Rocket

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● Abstract

System study of a next generation launch vehicle, which is a partially-reusable vehicle to reduce transportation cost drastically, are being conducted. Aerodynamic characteristics of the vehicle are numerically studied with various vehicle configurations and flight conditions to find the optimal system design and to progress the overall system design.

● Reasons and benefits of using JAXA Supercomputer System

Parametric Study for CFD

● Achievements of the Year

Aerodynamic characteristics of a partially reusable launch vehicle were evaluated. The aerodynamic characteristics are crucially important in terms of progressing the overall vehicle system design and other sub-system design such as flight control systems, structure systems and propulsion systems since the aerodynamics characteristics are fundamental input data for various analysis.

● Publications

N/A

● Usage of JSS

● Computational Information

Process Parallelization Methods	MPI
Thread Parallelization Methods	N/A
Number of Processes	480 - 3840
Elapsed Time per Case	24 Hour(s)

● **JSS3 Resources Used**

Fraction of Usage in Total Resources*1(%): 0.20

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage*2(%)
TOKI-SORA	5,488,946.80	0.24
TOKI-ST	4,098.09	0.00
TOKI-GP	0.00	0.00
TOKI-XM	0.00	0.00
TOKI-LM	3,678.28	0.25
TOKI-TST	0.00	0.00
TOKI-TGP	0.00	0.00
TOKI-TLM	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2 (%)
/home	135.00	0.12
/data and /data2	13,703.33	0.11
/ssd	283.33	0.04

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2 (%)
J-SPACE	0.28	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.

● **ISV Software Licenses Used**

ISV Software Licenses Resources		
	ISV Software Licenses Used (Hours)	Fraction of Usage ^{*2} (%)
ISV Software Licenses (Total)	0.00	0.00

*2: Fraction of Usage : Percentage of usage relative to each resource used in one year.