

Development of Defensive Technology for Particle Ingestion

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● Abstract

The atmosphere in which aircraft fly is not ideal, with various fine particles (volcanic ash, yellow sand, water droplets, etc.) floating in the air. If fine particles are present in the flight path of an aircraft, they will be sucked in by the jet engine, causing problems such as erosion, deposition, and icing. These phenomena reduce the performance and lifetime of the engine, and sometimes even lead to accidents, so adequate countermeasures are necessary. This project is developing technology to protect against the effects of fine particles.

● Reasons and benefits of using JAXA Supercomputer System

To develop programs in an equivalent computer environment for future large-scale calculations.

● Achievements of the Year

We proceeded with debugging and refactoring of programs that had been developed in a PC cluster environment.

● Publications

N/A

● Usage of JSS

● Computational Information

Process Parallelization Methods	MPI
Thread Parallelization Methods	OpenMP
Number of Processes	4 - 12
Elapsed Time per Case	45 Minute(s)

- **JSS3 Resources Used**

Fraction of Usage in Total Resources*¹(%): 0.00

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage* ² (%)
TOKI-SORA	1,268.60	0.00
TOKI-ST	11,104.40	0.01
TOKI-GP	0.00	0.00
TOKI-XM	0.00	0.00
TOKI-LM	1.79	0.00
TOKI-TST	972.86	0.02
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	31.38	0.02
/data and /data2	7,263.05	0.03
/ssd	185.93	0.01

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage* ² (%)
J-SPACE	0.13	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)	106.11	0.07

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