development of multi-shot ice accretion code

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● **Abstract**

research and development of icing simulation tools for CbA

● **Reasons and benefits of using JAXA Supercomputer System**

Due to broadband time and spatial scales of ice accretation, huge computational resources and acceleration of computation by JSS are needed.

● **Achievements of the Year**

Mesh-deformation techniques in the basic multi-shot method implemented in the last year have been improved and can now be applied to three-dimensional calculations.

● **Publications**

- Non peer-reviewed papers

Kei Shimura and Ide Yuki, Multi-Shot Icing Simulation for Airfoils by JAXA FaSTAR-ICE, AIAA 2024-3609, 2024.

● **Usage of JSS**

● **Computational Information**

Process Parallelization Methods	MPI
Thread Parallelization Methods	OpenMP
Number of Processes	1
Elapsed Time per Case	24 Hour(s)

- **JSS3 Resources Used**

Fraction of Usage in Total Resources[*1](%): 0.15

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage[*2](%)
TOKI-SORA	2,363,966.16	0.11
TOKI-ST	570,397.52	0.59
TOKI-GP	0.00	0.00
TOKI-XM	0.00	0.00
TOKI-LM	4,395.57	0.32
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	4.00	0.00
/data and /data2	6,425.43	0.03
/ssd	0.00	0.00

Archiver Resources		
Archiver 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.

● **ISV Software Licenses Used**

ISV Software Licenses Resources		
	ISV Software Licenses Used (Hours)	Fraction of Usage[2] (%)
ISV Software Licenses (Total)	15.72	0.01

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