Multivariate time series data analysis

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● **Abstract**

Knowledge extraction techniques for large datasets are important because the computers and numerical simulation techniques have been highly developed and they are producing a huge amount of data. In this study, we have been developing knowledge extraction tools which extract patterns from large data obtained by unsteady fluid simulations.

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

To perform large-scale data analysis utilizing the large memory capacity   and massively parallel simulations.

● **Achievements of the Year**

Steady and unsteady fluid simulations were conducted to obtain a dataset relavant to transonic buffet phenomena, and development of a machine learning model to predict the buffet onset was conducted based on the obtained dataset.

● **Publications**

N/A

🔵 **Usage of JSS**

● **Computational Information**

Process Parallelization Methods	MPI
Thread Parallelization Methods	N/A
Number of Processes	8 - 512
Elapsed Time per Case	20 Hour(s)

● **JSS3 Resources Used**

Fraction of Usage in Total Resources[*1](%): 0.24

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage[*2](%)
TOKI-SORA	5,517,377.19	0.27
TOKI-ST	19,630.13	0.02
TOKI-GP	453.34	0.30
TOKI-XM	1,751.16	1.26
TOKI-LM	1,080.98	0.08
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	601.67	0.60
/data and /data2	40,306.00	0.43
/ssd	698.33	0.18

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage[*2](%)
J-SPACE	6.32	0.04

[*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)	202.62	0.14

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