

## Study on multi-dimensional 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 produced huge datasets. In this study, we have been developing knowledge extraction tools which extract patterns from large data sets obtained by unsteady fluid simulations.

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

To perform feature extraction analysis utilizing the large scale memory of LM node, and massively parallel analysis using MA nodes.

### ● **Achievements of the Year**

Using the developed knowledge extraction tool, we extracted several dominant structures existing in the compressible flow field around a sphere. In addition, instability phenomenon on the three-dimensional cavity tone phenomenon was clarified.

### ● **Publications**

N/A

● Usage of JSS2

● Computational Information

Process Parallelization Methods	MPI
Thread Parallelization Methods	OpenMP
Number of Processes	1 - 512
Elapsed Time per Case	10 Hour(s)

● Resources Used

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

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2(%)
SORA-MA	2,119,501.16	0.26
SORA-PP	1,860.24	0.01
SORA-LM	1,456.44	0.61
SORA-TPP	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2(%)
/home	465.48	0.39
/data	11,974.52	0.20
/ltmp	1,906.62	0.16

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2(%)
J-SPACE	7.04	0.18

\*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.