

Study on dynamic instability of a reentry capsule at transonic speed

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Subject Category: Skills Acquisition System

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● **Abstract**

It is suggested that fluid phenomena of specific frequency may affect the dynamic instability of atmospheric entry capsules. In this study, numerical fluid calculation was carried out for the blunt body shape, and the wake structure was investigated using dynamic mode decomposition.

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

Large cost is required to simulate unsteady flow fields.

● **Achievements of the Year**

Unsteady fluid simulation around a blunt body at subsonic speeds and pattern extraction by dynamic mode decomposition were carried out.

● **Publications**

N/A

● **Usage of JSS2**

● **Computational Information**

Process Parallelization Methods	MPI
Thread Parallelization Methods	N/A
Number of Processes	128
Elapsed Time per Case	50 Hour(s)

- **Resources Used**

Fraction of Usage in Total Resources*1(%): 0.04

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2(%)
SORA-MA	104,346.82	0.01
SORA-PP	24,899.36	0.16
SORA-LM	1,428.87	0.60
SORA-TPP	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2(%)
/home	238.42	0.20
/data	42,480.49	0.73
/ltmp	976.56	0.08

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2(%)
J-SPACE	17.33	0.44

*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.