

Dynamics analysis of JDS (Japan Docking System) soft capture system

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Subject Category: Human Spaceflight Technology

URL: <https://www.jss.jaxa.jp/en/ar/e2023/23642/>

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● Abstract

On-orbit dynamics simulation of docking mechanism (JDS: Japan Docking Mechanism) for autonomous docking demonstration by HTV-X

Ref. URL: <https://humans-in-space.jaxa.jp/en/>

● Reasons and benefits of using JAXA Supercomputer System

All JAXA employee can use JSS quickly and easily without any complicated procedures.

The system can be connected within the JAXA intranet, so there is little risk of information leakage.

Quick access to extensive support on how to use the system.

Linux container technology can be applied.

● Achievements of the Year

For the on-orbit demonstration of automated docking with HTV-X JDS (Japan Docking System), it is necessary to ensure docking capability under various docking conditions (e.g., speed/attitude). In this study, NASA-Trick, a docking simulator provided by NASA, has been utilized to enable parameter studies of the automated docking system design.

JSS contributes to reduce calculation time significantly. JSS analysis environment enabled us to conduct more than 300,000 cases of monte-carlo analysis which are required to verify docking dynamics performance.

● Publications

N/A

● Usage of JSS

● Computational Information

Process Parallelization Methods	N/A
Thread Parallelization Methods	N/A
Number of Processes	1
Elapsed Time per Case	1 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	0.00	0.00
TOKI-ST	14,458.71	0.02
TOKI-GP	0.00	0.00
TOKI-XM	0.00	0.00
TOKI-LM	0.00	0.00
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	210.00	0.17
/data and /data2	12,125.00	0.07
/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)	0.00	0.00

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