

Research on advanced rocket engines

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● Abstract

The objective of our work is to accelerate ongoing projects such as RV-X and CALLISTO, which are R&D of small reusable rockets, and future researches on reusable and advanced rocket engines through numerical simulations.

● Reasons and benefits of using JAXA Supercomputer System

It is very useful for researchers who make R&D of advanced rocket engines that various softwares such as CFD and FEM are available.

● Achievements of the Year

Coupled thermal fluid simulations were made for radial gap motors and axial gap motors which will be used in electric pumps of electric pump fed cycle rocket engines. The efficient cooling method of these motors were examined.

The pump and the motor were simulated as a single numerical model to examine thermal and fluid conditions in these systems.

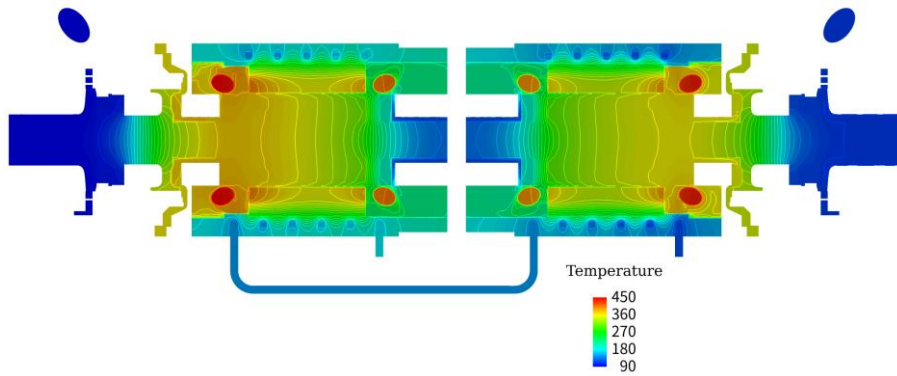


Fig. 1: The temperature distribution in the 2 sets of the radial gap motor and pump, in which cooling path is sequentially connected.

● **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 Second(s)

● **JSS3 Resources Used**

Fraction of Usage in Total Resources*1(%): 0.12

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage*2(%)
TOKI-SORA	0.00	0.00
TOKI-ST	0.00	0.00
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	90.43	0.08
/data and /data2	100.00	0.00
/ssd	0.00	0.00

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage* ² (%)
J-SPACE	0.08	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)	10,766.00	4.86

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