

Research on Space Exploration Technology (Research on Radiation Protection Technology)

Report Number: R21EDG10101

Subject Category: Research and Development

URL: <https://www.jss.jaxa.jp/en/ar/e2021/18575/>

● Responsible Representative

Aki Goto, Researcher, Research and Development Directorate, Unit I

● Contact Information

Research and Development Directorate, Research Unit I, Aki Goto(goto.aki@jaxa.jp)

● Members

Mari Aida, Aki Goto, Aiko Nagamatsu

● Abstract

This research aims to obtain the radiation protection technologies for future international space exploration.

● Reasons and benefits of using JAXA Supercomputer System

JAXA super computer system was used for the fast simulation calculations using Particle and Heavy Ion Transport code System (PHITS).

● Achievements of the Year

To evaluate doses on the D-Space dosimeter installed on the OMOTENASHI, the geometries were prepared for both OMOTENASHI and D-Space, and the doses at the Si sensors placing inside the dosimeter were calculated under the isotropic irradiation of galactic cosmic rays (GCRs). For OMOTENASHI, four geometries with different accuracy levels were prepared and used. As a result, the doses at the Si sensors depended on the accuracy levels of the geometries. It seems to be important to better reproduce the shielding environments surrounding the Si sensors for more accurate simulations.

● Publications

N/A

● Usage of JSS

● Computational Information

Process Parallelization Methods	MPI
Thread Parallelization Methods	Automatic Parallelization
Number of Processes	36 - 108
Elapsed Time per Case	43200 Second(s)

● JSS3 Resources Used

Fraction of Usage in Total Resources*1(%): 0.01

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage*2(%)
TOKI-SORA	511.53	0.00
TOKI-ST	42,842.55	0.05
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	13.33	0.01
/data and /data2	133.33	0.00
/ssd	133.33	0.03

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.