Evaluation of cosmic ray effects in the CMB satellite LiteBIRD

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Abstract

Assessment of the cosmic-ray effects to the cosmic microwave background observation satellite LiteBIRD

Reasons and benefits of using JAXA Supercomputer System

This study requires to simulate very long observation data with different setting parameters. The calculation can be done in parallel, thus the use of HPC is suited.

Achievements of the Year

We did not use the computational resources for this fiscal year. Based on the results obtained with JSS2 last fiscal year, we published in pappers.

Publications

- Peer-reviewed papers

"Simulations of systematic effects arising from cosmic rays in the LiteBIRD space telescope, and effects on the measurements of CMB B-modes"

Stever, S.L. & Ghigna, T. & Tominaga, M. & Puglisi, G. & Tsujimoto, M. & Marazzini, M. Zeccoli & Baratto, M. & Tomasi, M. & Minami, Y. et al., 2021, Journal of Cosmology and Astroparticle Physics, 2021, 013

- Non peer-reviewed papers

"Simulation of the cosmic ray effects for the LiteBIRD satellite observing the CMB B-mode polarization", Tominaga, Mayu, Tsujimoto, Masahiro, Stever, Samantha Lynn, Ghigna, Tommaso, Ishino, HIrokazu, et al.Proc. SPIE 11453, Millimeter, Submillimeter, and Far-Infrared Detectors and Instrumentation for Astronomy X, 114532H (13 December 2020); doi: 10.1117/12.2576127

- Other

"Assessment of cosmic-ray noise effects and design of the onboard data processing for LiteBIRD", Mayu Tominaga, Master thesis, 2021, University of Tokyo

Usage of JSS

Computational Information

Process Parallelization Methods	N/A
Thread Parallelization Methods	N/A
Number of Processes	1
Elapsed Time per Case	24 Hour(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	18.10	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	148.33	0.15
/data and /data2	983.33	0.01
/ssd	983.33	0.25

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.