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

● **Responsible Representative**

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● **Abstract**

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

Ref. URL: http://litebird.jp/

● **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 conducted the following study this year. We constructed a physical model for the interaction between cosmic-rays and the detectors and generated mock observation data in the time-domain that are contaminated by cosmic-ray noise injections. We deconvolved the data with the scannling law of the spacecraft and the rotating half-wave plate to calculate the large-scale anisotropy of the linear polarization expected from the primordial gravitational wave of the cosmic inflation in an end-to-end manner. In this study, we explored the HPC's utility in accelerating the simulation of the time-domain data.

● **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 Hour(s)

●   **Resources Used(JSS2)**

Fraction of Usage in Total Resources[1](%): 0.00

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage[2](%)
SORA-MA	0.00	0.00
SORA-PP	346.64	0.00
SORA-LM	89.26	0.05
SORA-TPP	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage[2](%)
/home	32.90	0.03
/data	329.02	0.01
/ltmp	6,738.28	0.57

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.

● **Resources Used(JSS3)**

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

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage[*2](%)
TOKI-SORA	0.00	0.00
TOKI-RURI	15.02	0.00
TOKI-TRURI	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage[*2](%)
/home	46.09	0.03
/data	460.94	0.01
/ssd	460.94	0.24

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.