Hier-level data processing of JAXA's science satellite data

● **Responsible Representative**

EBISAWA, Ken, Professor, Department of Astrophysics, Institute of Space and Adtronautical Science

● **Contact Information**

EBISAWA, Ken (ebisawa.ken@jaxa.jp)

● **Members**

Ken Ebisawa, Takashi Hasebe, Miki Kurihara, Takuya Midooka, Yuto Mochizuki, Misaki Mizumoto, Tomoki Nagatsuka, Satoshi Nakahira, Tomoki Omama, Samantha Stever, Yuki Sakurai, Masahiro Tsujimoto, Mayu Tominaga, Yusuke Takase, Hayato Takakura

● **Abstract**

Perform more advanced data processing than standard data processing on the data acquired by JAXA's scientific satellites. In addition, simulations will be performed that will enhance the value of JAXA's scientific satellite data.

● **Reasons and benefits of using JAXA Supercomputer System**

Advanced data processing and simulation require an enormous amount of computation time. By using supercomputers, we can save computation time and devote more time to considering and examining the calculation results.

● **Achievements of the Year**

Simulation calculations were performed to investigate the situation in which an X-ray source photoionizes the surrounding plasma and the effect of the plasma on the observed spectrum. The calculations were performed using a publicly available package called XSTAR. The capability of JSS3 was needed to calculate the plasma column density, ionization parameters, and disturbance velocity in many different values. The calculations were performed on a 3-dimensional grid point by varying those three parameters in small increments. It was made into a file as a table model and interpolated among the grid points in order to compare it with actual observations. Using this table model, we were able to efficiently analyze data from multiple active central nuclei (super-massive black holes).

● **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	20 Hour(s)

●   **JSS3 Resources Used**

Fraction of Usage in Total Resources[1](%): 0.21

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage[2](%)
TOKI-SORA	15.74	0.00
TOKI-ST	1,522,280.97	1.52
TOKI-GP	26,033.39	1.11
TOKI-XM	1,676.59	1.05
TOKI-LM	0.07	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	768.33	0.70
/data and /data2	72,530.00	0.56
/ssd	33,801.33	4.68

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage[2] (%)
J-SPACE	7.64	0.03

[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.