Study for Multi- footprint Observation Lidar and Image(MOLI) Project

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Abstract

Develop algorithms for processing space lidar observation data in the ISS Onboard Lidar Demonstration (MOLI) project.

Reasons and benefits of using JAXA Supercomputer System

MOLI observes the entire globe with lidar, and its data can reach several billion shots per year. In addition, some of the algorithms for processing this data use deep learning, which requires more computation time than CPU calculations. JSS3 is the only system that can process such data in the limited time available for product distribution, and we are considering using it not only for algorithm development, but also as a processing system for products.

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Achievements of the Year

(1) Simulation of large-scale space lidar observation data was conducted using ALS data from the Izu Peninsula, and an algorithm for MOLI products was developed to use the data as teacher data for deep learning. This may enable us to measure tree height and biomass with higher accuracy than before, and we plan to publish a paper on the results in FY2023.

(2) Algorithms were developed to create global AGB maps by fusing GCOM-C/SGLI data with space lidar GEDI observation data. As an extension of the SGLI product ver. 3 development conducted last year, a land cover classification was conducted aiming at a classification related to plant volume density rather than plant type.

Publications

N/A

Usage of JSS

Computational Information

Process Parallelization Methods	N/A
Thread Parallelization Methods	Automatic Parallelization
Number of Processes	1
Elapsed Time per Case	12 Hour(s)

JSS3 Resources Used

Fraction of Usage in Total Resources[*1](%): 1.19

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage[*2](%)
TOKI-SORA	0.00	0.00
TOKI-ST	9,080,117.84	9.08
TOKI-GP	49,079.68	2.09
TOKI-XM	0.00	0.00
TOKI-LM	16,949.10	1.14
TOKI-TST	119,760.35	3.16
TOKI-TGP	0.00	0.00
TOKI-TLM	622.92	1.29

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2 (%)
/home	10.00	0.01
/data and /data2	163,890.00	1.26
/ssd	100.00	0.01

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2 (%)
J-SPACE	388.55	1.72

*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.