

Upper Weather Prediction

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● Abstract

This study aims to develop the reanalysis system for upper atmospheric density to improve the satellite orbit prediction accuracy.

● Reasons and benefits of using JAXA Supercomputer System

In order to realize atmospheric density reanalysis, it is required to perform atmospheric density model calculation with many calculation conditions simultaneously.

● Achievements of the Year

The developed data assimilation system called SUBARU was established. SUBARU has three atmospheric density models, and we confirmed that SUBARU worked without problems in the case of one data assimilation parameter. Furthermore, we completed a system to compute orbital ephemeris generation using the density data provided from SUBARU. We are working on evaluation of the generated ephemeris.

● Publications

- Oral Presentations

Hiroshi Kato, Hideaki Hinagawa, Kyohei Akiyama, Yuki Akiyama, Masaya Nakano, Daichi Obinata, and Shinichi Nakamura, "Development of Data Assimilation System for Atmospheric Density to Improve Satellite's Orbit Prediction Accuracy", JpGU 2019, May, 2019, Makuhari, Japan.

- Usage of JSS2

- Computational Information

Process Parallelization Methods	N/A
Thread Parallelization Methods	Automatic Parallelization
Number of Processes	1
Elapsed Time per Case	20 Minute(s)

- Resources Used

Fraction of Usage in Total Resources*1(%): 0.09

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2(%)
SORA-MA	56,117.64	0.01
SORA-PP	174,881.43	1.13
SORA-LM	0.00	0.00
SORA-TPP	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2(%)
/home	98.55	0.08
/data	82,106.31	1.41
/ltmp	9,309.90	0.79

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2(%)
J-SPACE	7.85	0.20

*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.