

On-board clear-air turbulence prediction

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Abstract

CAT (clear-air turbulence) simulations for research on on-board CAT prediction system.

Reasons and benefits of using JAXA Supercomputer System

JSS is used to simulate the clear-air turbulence encountered by aircraft in weather analysis programmes.

Achievements of the Year

Strong turbulence, where aircraft encounter strong turbulence, was simulated using the Weather Research Forecasting Model (WRF). As the turbulence of interest is a local phenomenon with a wavelength of 800 m to 4,000 m, a simulation method was established for turbulence causing more than moderate turbulence, using a grid with a pitch of about 50 m, which is finer than the grid used in normal weather simulations.

Publications

N/A

Usage of JSS

Computational Information

| | |
|---------------------------------|------------|
| Process Parallelization Methods | MPI |
| Thread Parallelization Methods | N/A |
| Number of Processes | 1 - 64 |
| Elapsed Time per Case | 24 Hour(s) |

- **JSS3 Resources Used**

Fraction of Usage in Total Resources*1(%): 0.04

Details

| Computational Resources | | |
|-------------------------|--------------------------------------|------------------------|
| System Name | CPU Resources Used (core x hours) | Fraction of Usage*2(%) |
| TOKI-SORA | 1,038,070.20 | 0.05 |
| TOKI-ST | 0.00 | 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 | 245.00 | 0.17 |
| /data and /data2 | 23,482.00 | 0.11 |
| /ssd | 0.00 | 0.00 |

| 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.