

PARTICIPATION REPORT

TO: The CEO of KAGI 21, Department of Geophysics and School of Science

Cc: Secretary of KAGI 21, Department of Geophysics and School of Science

FROM: [Mr. Palikone Thalongsechanh \(COE Postdoctoral Researcher\)](#)
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Subject: Back-to-Office Report on The 17th IHP Training Course
(COE, KAGI21 Office)

On Numerical Prediction of High-Impact Weather System

For your information, please find the attached here to the back-to-Office Report on the above mentioned 17th IHP Training Course

December 19, 2007, Kyoto, Japan
Department of Geophysics and School of Science

Back-to-Office Report
On
Numerical Prediction of High-Impact Weather Systems
(International Hydrological Programme-HyARC, Nagoya University)
02-15 December, 2007, Japan

1. NAME OF TRAVELER

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2. ITINERARY AND DATE OF TRAVEL

Kyoto – Nagoya

December 02, 2007

Nagoya – Kyoto

December 15, 2007

3. PURPOSE OF TRAVEL and Objectives

- To participate in the Seventeenth IHP Training Course on Numerical Prediction of High-Impact Weather Systems;
- High –impact weather systems are most significant phenomena in the atmosphere and occasionally cause huge disasters to human society. For understanding their mechanisms and structures is necessary for prediction and prevention/reduction of disasters on meteorology.

4. REPORT

4.1 Report on Seventeenth IHP Training Course on Numerical Prediction of High-Impact Weather Systems

Sunday 02, December

- Arrival in Nagoya (The Hotel Mielparque-Nagoya) and replacing in lodge of Nagoya University

Monday 03, December

- Opening remarks by Prof. UYEDA Hiroshi, Director of Hydrosphere Atmospheric Research Center (HyARC) , Nagoya University
- Introduction of guidance (Lecture 0, 1) and outline of this training course by Prof. Tsuboki K., HyARC, Secretary and Coordinator of IHP training course.
- We have learned lecture 1 concerning basic on Mesoscale meteorological and numerical models:
 1. Introductory lecture 3 of meso-scale meteorology and overview of non-hydrostatic numerical model:
 - Governing Equations for numerical models (pressure? Coriolis force? Potential temperature?)
 - Multi-scale horizontal structure of meteorological disturbances
 - Examples of Mesoscale precipitation events
 2. Analytical or statistical models on Computational Fluid Dynamics:
- Basics of computational fluid dynamics and environmental simulation with Nagoya Supercomputer

- Visualization of computational fluid dynamics

Tuesday 04, December

- The lecturer 2 and 3 has explained the topic on the Importance of Surface Heating in Short-term Numerical Weather Prediction which covering:
 1. Six numerical experiments are carried out in mountainous region around the Lake Biwa on 14th and 15th August in 2001, Japan
 2. Experimental design with configuration of atmospheric model
 3. Numerical experiment for land cover change (Case 3 & Case 4) including with an experimental design
- We have also learned about basic of CReSS model in the natural atmosphere(lecture 7 & 8) which is included:
 1. Computer system at the Information Center, Nagoya University
 2. Computer + practical sessions of CReSS model and simulation NWP

Wednesday 05, December

- We has learned lecture 4 and 5 on Cloud Resolving model and Parallel processing of the cloud resolving model
- The lecturer has also introduced an observation atmospheric process. In this lecture consist:
 1. Dynamic process and physical process of cloud resolving model;
 2. Introduction of the Cloud Resolving Storm Simulation (CReSS, SiBUC);
 3. Computer practical session with model resolution and assimilation of tropical cycle case study (1999 and 2005)

Thursday 06, December

- We have learned lecture 9 on AGCM for the Earth Simulator which is consisted:
 1. Introduction of the AFES (the AGCM for Earth Simulator)
 2. Simulation experiment using the AFES model and data assimilation by non-hydrostatic atmospheric model for NWP (Operational Development by JMA)
 3. Practice on PC (CReSS) at Information Center, Nagoya University
 4. Learning Basic Equation systems of a non-hydrostatic model (a cloud resolving model)

Friday 07, December

- We have learned lectures 6 Non-hydrostatic Atmospheric Models and Operational Development by JMA (MRI) as covered:
 - 1) Overview non-hydrostatic atmospheric models for research and NWP;
 - 2) Classification of non-hydrostatic atmospheric models and numerical methods to treat sound waves are described with their relative advantages;
 - 3) Computer practice and exercise (CReSS model) with configuration and execution of user configuration.

Saturday 08, December

- We have moved from Nagoya to Tokyo for field trip and technical tour, and two night stay at Hotel Juraku (Tokyo) and KKR – Tokyo Hotel

Sunday 09, December

- Technical Tour and Field trip around Tokyo City, sightseeing around Tokyo city (The Museum of the Imperial Collections, Sannomaru Shozokan ...etc)

Monday 10, December

- Visited JMA, we seen how to predict tropical cycle track with heavy rainfall during monsoon season (See photo)
- We have visited the Earth Simulator Center (Super computer) in Yokohama (JAMSTEC), move from Yokohama to HyARC, Nagoya University (See photo)

Tuesday 11, December

- Continuously learning lecture 2 focusing on Computation Fluid Dynamics and Computer practical session with Simulation and numerical Experiments (CReSS model) for Typhoon case (T0423RUSA and T0613 Tornadoes)
- Computation design for vertical cross section (Wind vertical velocity and mixing ratio of precipitation.....)

Wednesday 12, December

- We have learned lecture 11 on Typhoon simulation which focused as:
 - 1) Basic properties of Typhoons
 - 2) Basic Mechanisms of Typhoon (how they form? In what condition?, what controls their intensity, size, moment?)
 - 3) Life cycle of typhoons (Observation of satellite images, Review of typhoon simulations)
- Computer practice on the Basic mechanisms of Typhoon and TC movement.....

Thursday 13, December

- We have learned a lecture 10 about Global non-hydrostatic model as covered:
 - 1) Introduction of global non-hydrostatic model, NICAM
- Practice 2 continued with computation for CReSS models simulation

Friday 14, December

- We have learned Lecture 12 on Radar Observation and Cloud Resolving Mode by NIED (TSUKUBA, Japan) which concerning on high impact weather and data assimilation between numerical simulation and Observation (Data assimilation and data simulation)
- Rainfall Estimation by Using Radar Reflectivity and aliasing of Doppler Velocity (3d Wind Fields and Case of Snowstorm in Hokuriku by Yr 2000)

- We have written the report and presented to the admission board of Seventeenth IHP Training Course (assessment + comments and evaluation)
- **Closing ceremony by Prof. UYEDA Hiroshi , Director of HyARC, handing Certificate and Farewell party** (See photos)

Saturday 15, December

- Departure to Kyoto

5. Conclusion

The Seventeenth IHP Training Course on Numerical Prediction of High-Impact Weather Systems from 02 – 15 December, 2007 in Nagoya and Tokyo, Japan was successful and very useful. The content of the course was quite good and interesting, it has varieties of valuable scientific researches. The lecturers explained in each topic with a comprehensive and clearly understanding. From this training course, almost of participants have got a lot kind of experiences in the field of atmospheric process, especially the problems which are risen now and will rise in the future with regional and global Mesoscale model (NWP and CReSS). The organizer and local committee of this course was also good for arrangement and giving of all facilities and good accommodation to the participants from abroad country and inside of Japan.

Thankful to The CEO of KAGI21, Kyoto University for kind supporting me to attending in this Training Course