

# Report of AsiaFlux Training Course 2006

## AsiaFlux Short Training Courses Sub Working Group

Leader: Nobuko Saigusa (AIST)

Sub-leader: Kentaro Takagi (Hokkaido University)

Members:

- Ryuichi Hirata (NIES), Koh Inukai (NIES), Shohei Murayama (AIST), Liang Naishen (NIES), Huimin Wang (AIST), Tsutomu Watanabe (FFPRI), Satoko Yuta (NIES)

and thanks to..

Toshihiko Sugiura (NIFTS), Reina Nakamura (FFPRI), Masayoshi Mano (NIAES) & Yoshikazu Ohtani (FFPRI)



## I. Announcement

**AsiaFlux Training Course on Micrometeorology**  
- Theory and Practice of CO<sub>2</sub> Flux Measurement -

**Outline** 21<sup>st</sup> - 30<sup>th</sup> August 2006

**Date** 21<sup>st</sup> - 30<sup>th</sup> August 2006

**Venue** National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan

**Registration** Applications must be submitted through registration form at [www.asiaflux.net/asiaflux2006.html](http://www.asiaflux.net/asiaflux2006.html) by 31 December 2005. Applicants will be required to offer a brief description of their studies and research activities. Acceptance notice will be sent by 31 March 2006.

**Information** For details, please visit AsiaFlux Website at [www.asiaflux.net](http://www.asiaflux.net) or contact AsiaFlux Secretariat at [asiaflux@nias.ac.jp](mailto:asiaflux@nias.ac.jp).

## II. Students

20 candidates were selected from 68 applicants

- Bangladesh 2
  - China 6
  - India 2
  - Indonesia
  - Malaysia
  - Philippines 2
  - Taiwan 2
  - Thailand 3
  - Vietnam
- Their backgrounds are..
- Agriculture
  - Plant physiology
  - Applied bioscience
  - Environment
  - Meteorology
  - Atmospheric science
  - Forestry
  - Soil Chemistry
  - Ecology



14 Doctors, 4 Masters and 2 Bachelors

## III. Program

### 1. Calibration of flux sensors, Setting up two open path systems and Measuring turbulent fluctuations



### 2. Field trip to 3 AsiaFlux sites

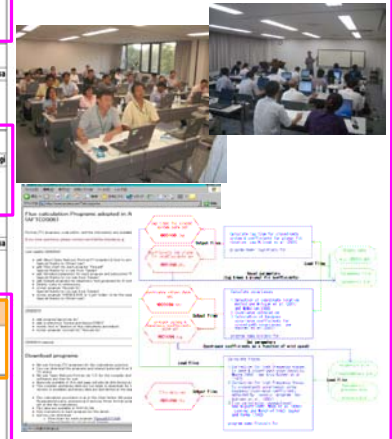


### 4. Lectures

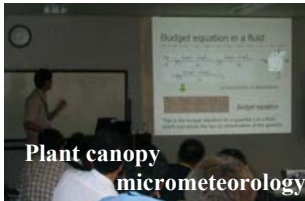
- K. Higuchi (Meteorological Service of Canada)
- T. Hirano (Hokkaido University)
- J. Kim (Yonsei University)
- A. Miyata (National Institute of Agro-Environmental Sciences)
- Y. Ohtani (Forestry and Forest Products Research Institute)
- R. H. Shaw (UC Davis)
- T. Shimizu (Forestry and Forest Products Research Institute)
- T. Watanabe (Forestry and Forest Products Research Institute)
- X. Wen (Chinese Academy of Sciences)

Morning (9:00-11:30)	Afternoon I (13:00-15:00)	Afternoon II (15:30-17:30)	Evening Program (intro'd)
21-Aug Orientation Lecturer: Dr. T. Ohtani & AsiaFlux TC-SWG Keywords: Logistics; Schedule; Textbook; Computer	Basic of global warming Lecturer: Dr. K. Higuchi Keywords: Global warming; Carbon balance of the earth; Carbon cycle of several terrestrial ecosystems	Basic of plant canopy micrometeorology Lecturer: Dr. T. Watanabe Keywords: Microclimate of crops and forests; Radiation in plant canopy; Heat, momentum and CO <sub>2</sub> exchange between plant canopy and atmosphere; Physiological controls of the H <sub>2</sub> O and CO <sub>2</sub> exchange; Soil-plant-atmosphere models (except the contents on the 8th day)	Self-introduction by students Dr. Saigusa
22-Aug Sensors and flux measurements I Instructor: Mr. T. Shimizu Keywords: Site selection (soil, topography); Fundamental facilities; Power source; Instrumentation; Sensors for micrometeorology	Sensors and flux measurements II Instructor: Mr. T. Shimizu Keywords: Eddy covariance techniques; Flux & Spectrom; Sensors & Outline for the lecture on 4 & 5th day	Basic programming Lecturer: AsiaFlux TC-SWG Keywords: Computer Programming; Data I/O; Arithmetic	Self-introduction by students Dr. Takagi
23-Aug System setup and data acquisition Keywords: Open system set up; Data acquisition; Acquired data will be used for the flux calculation on the next days	Flux calculation I Instructor: AsiaFlux TC-SWG Keywords: Data conversion; Averaging; Rotation; Phase fit; Covariance calculation	Flux calculation I Instructor: AsiaFlux TC-SWG Keywords: Data conversion; Averaging; Rotation; Phase fit; Covariance calculation	Self-introduction by students Dr. Saigusa
24-Aug Flux calculation II Instructor: AsiaFlux TC-SWG Keywords: Flux calculation and corrections for both open and closed systems	Flux calculation II Instructor: AsiaFlux TC-SWG Keywords: Flux calculation and corrections for open/closed systems	Field trip to Fujiyoshida Keywords: Flux calculation and corrections for open/closed systems	Self-introduction by students Dr. Saigusa
25-Aug Field trip to Fujiyoshida flux site Keywords: FFPRI and NIES sites; Automated chamber system; Biometrical surveys	Instructor: AsiaFlux TC-SWG		
27-Aug Re classes 27-Aug Basics of the Atmospheric boundary layer I Lecturer: Dr. R. Shaw Keywords: Planetary boundary layer; Surface boundary layer; Structure under convective and nocturnal conditions; Atmospheric turbulence	Basics of the Atmospheric boundary layer II Lecturer: Dr. R. Shaw Keywords: Statistical and spectral description of turbulence; Stability; Surface layer similarity; Diffusion models	System maintaining Lecturer: Dr. T. Hirano & AsiaFlux TC-SWG Keywords: Possible troubles and errors; Solutions to it;	
29-Aug QC & QA I (with computer practice) Lecturer: Dr. A. Miyata Keywords: Flux range; Spectral analysis; $\omega^2$ correction	QC & QA II (with computer practice) Lecturer: Dr. A. Miyata Keywords: Vickers & Mahrt, 1997	QC & QA III (with computer practice) Lecturer: Dr. A. Miyata Keywords: Stationarity; Integral turbulence characteristics; Footprint analysis	
30-Aug Gap filling Lecturer: Dr. X. Wen Keywords: $\omega^2$ correction; Nonlinear regression; LUT; HDV	Trends and Challenges in flux studies Open seminar Lecturer: Dr. S. Kim and R. Shaw Keywords: Complex topography; Nocturnal flux; Drainage flow; Long-term monitoring; Fluxnet	Closing Session Dr. T. Ohtani & AsiaFlux TC-SWG	

### 3. Flux calculation using raw data set and Fortran 77+ codes on PC



### 5. Open seminar & Closing session



## IV. AFTC 2007

**AsiaFlux Training Course 2007 on Micrometeorology**  
- Theory and Practice of CO<sub>2</sub> Flux Measurement -

**Outline** 16<sup>th</sup> - 27<sup>th</sup> July 2007

**Date** 16<sup>th</sup> - 27<sup>th</sup> July 2007

**Venue** Seoul, Korea

Aim of this course is to provide a fundamental and comprehensive knowledge of current micrometeorological theory to flux principal investigators in Asia. We seek applicants from various backgrounds. We target the participants particularly who:

**AsiaFlux Training Course 2007 will be held in July at Seoul, Korea**  
The announcement will be soon at <http://www.asiaflux.net>