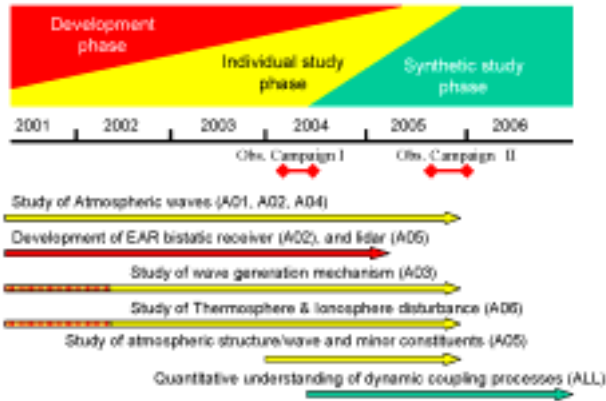
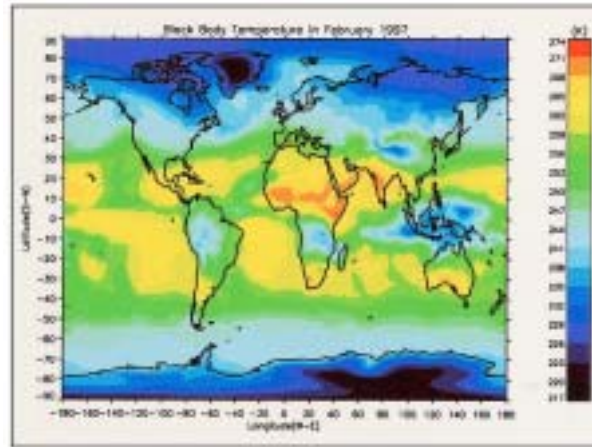


## Schedule of the CPEA



## International Observation Campaign

The CPEA will seek pioneering researches on vertical couplings of the equatorial atmosphere. We plan two intensive observation periods as the international observation campaign of the CPEA. The first CPEA campaign will be conducted in Indonesia from March to April 2004. (The second campaign is planned in 2005.) In the observation campaign, we try to concentrate as many as instruments around the EAR site to observe the whole equatorial atmosphere from the troposphere to the ionosphere. However, the region of the experiment is limited within Indonesia. We welcome any coordinated observations in any countries and areas in the tropics during the same period, which should enhance and fulfill the ultimate purpose of the study. We hope for new findings from many coordinated observations.



## Reason why we choose Indonesia

The figure (above) shows mean cloud-top temperature observed by meteorological satellites in February 1997. The most active convective clouds are observed over 'maritime continent Indonesia'. The region is surrounded by the warmest sea-water in the world, and the dynamical processes in the atmosphere are most intense. The situation makes it very suitable to conduct the CPEA project in Indonesia.

## CPEA organization

Project leader: Prof. Shoichiro Fukao (Kyoto Univ.)  
 A01: Dr. Mamoru Yamamoto (Kyoto Univ.)  
 A02: Prof. Toru Sato (Kyoto Univ.)  
 A03: Prof. Toshiaki Kozu (Shimane Univ.)  
 A04: Prof. Toshitaka Tsuda (Kyoto Univ.)  
 A05: Prof. Chikao Nagasawa (Tokyo Met. Univ.)  
 A06: Prof. Tadahiko Ogawa (Nagoya Univ.)

## Office

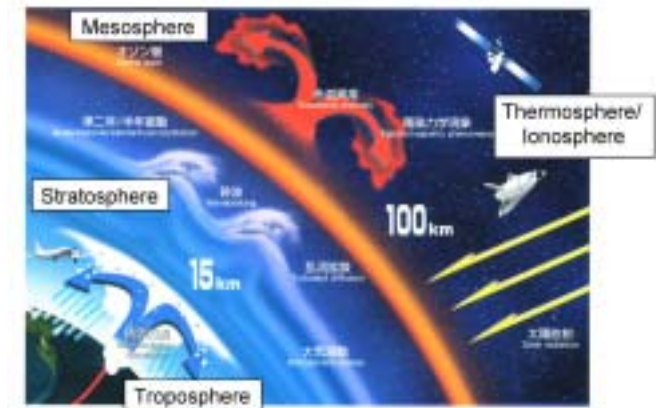
Dr. Mamoru Yamamoto  
 Radio Science Center for Space and Atmosphere,  
 Kyoto University  
 Gokasho, Uji, Kyoto 611-0011, JAPAN  
 FAX: +81-774-31-8463  
 E-mail: cpea@kurasc.kyoto-u.ac.jp  
<http://www.kurasc.kyoto-u.ac.jp/cpea>

# CPEA

## Coupling Processes in the Equatorial Atmosphere

Grant-in-Aid for Scientific Research on Priority Areas Funded by MEXT\*

## First International Observation Campaign of CPEA scheduled in March-April 2004



RADIO SCIENCE CENTER FOR SPACE AND ATMOSPHERE,  
 KYOTO UNIVERSITY

GRADUATE SCHOOL OF INFORMATICS,  
 KYOTO UNIVERSITY

INTERDISCIPLINARY FACULTY OF SCIENCE AND  
 ENGINEERING, SHIMANE UNIVERSITY

GRADUATE SCHOOL OF ENGINEERING,  
 TOKYO METROPOLITAN UNIVERSITY

SOLAR-TERRESTRIAL ENVIRONMENT LABORATORY,  
 NAGOYA UNIVERSITY

\*MEXT: JAPANESE MINISTRY OF EDUCATION, CULTURE,  
 SPORTS, SCIENCE AND TECHNOLOGY

## Overview

The western Pacific region called the Indonesian Archipelago is the center of the intense atmospheric motions and global atmospheric changes. The mechanisms of the atmospheric changes and fluctuations, however, have not yet been made clear due to the sparseness of observational data in that region. "Coupling Processes in the Equatorial Atmosphere (CPEA)" is a research program funded by Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) as a Grant-in-Aid for Scientific Research on Priority Areas in the period from September 2001 until March 2007. CPEA studies dynamical coupling processes in the equatorial atmosphere by conducting various observations in Indonesian equatorial region centered around the Equatorial Atmosphere Radar (EAR) that started observations in June 2001 right at the equator in West Sumatra, Indonesia under the collaboration between the Radio Science Center for Space and Atmosphere, Kyoto University and National Institute of Aeronautics and Space (LAPAN) of Indonesia.

Equatorial Atmosphere Radar (EAR)  
(Inaugurated in June 2001)

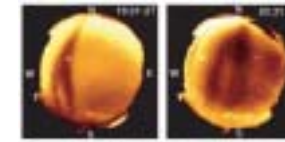


Antenna field (110m in diameter)

Location:  
Koto Tabang,  
West Sumatra,  
Indonesia  
(0.20°S, 100.32°E)



100 kW, 560 Yagi antennas



Airglow Imagers



Lidars

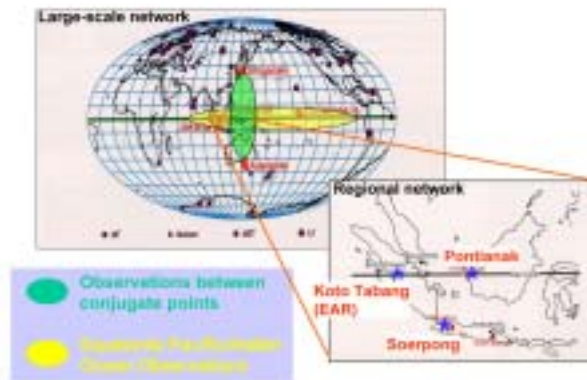
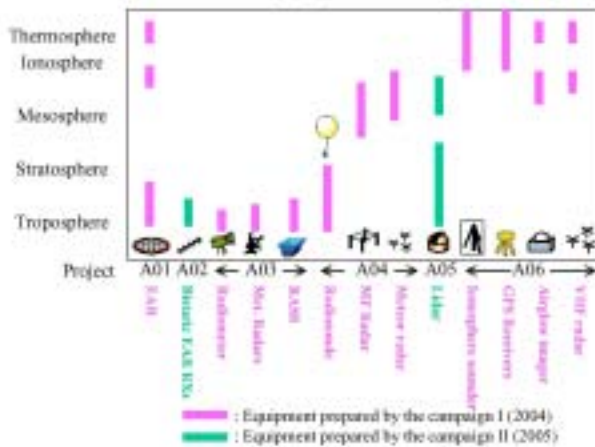
**Study of the equatorial upper atmosphere (Thermosphere and Ionosphere)**  
A06: Variation of the thermosphere and ionosphere owing to the energy of atmospheric waves (Airglow imager, GPS receivers, VHF radar, Ionosonde, Magnetometer)

**Study of the equatorial middle atmosphere (Stratosphere and Mesosphere)**  
A04: Four-dimensional structure of atmospheric waves and energy transportation (MF radar, Meteor radar, Radiosonde)  
A05: Vertical structure of the equatorial atmosphere with sophisticated lidars (Development of new lidar)

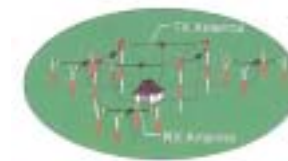
**Study of the equatorial convective activity and precipitation system (Troposphere)**  
A03: Evolution of convective clouds, and their coupling with meso- to large-scale precipitation systems (Meteorological radar, Water vapor radiometer, EAR-RASS, etc.)

**Study of the equatorial atmosphere with the EAR**  
A01: Study of Equatorial atmospheric waves by EAR long-term observations (EAR, Satellite data-link)  
A02: Functional expansion of EAR and new observation techniques (Multistatic receiving system)

CPEA: Observation equipment and height coverage



Expected network for the observation campaign in CPEA



MF radar / Meteor Radar



X-band Rain Radar