COAA e-Newsletter. Issue 10. April 30, 2004.

Published by the Chinese-American Oceanic and Atmospheric Association
P.O. Box 4948, Silver Spring, Maryland 20914-4948, USA

Members please submit news to "coaa.news@cox.net". Some examples of news items are:
Meeting/conference report/announcement; Research work/activity; Honors/Award /research grant; Promotion/graduation/change of position/employment/sabbatical; Latest publication/abstract; Job/research grant opportunity; Visit/exchange/collaboration; New member; Community outreach; Social event
---

Contents:

==========

(1) COAA Spring Workshop Summary, 3 April 2004, U. of Maryland

The COAA 2004 spring workshop: Research and applications in atmospheric and oceanic sciences, was held at University of Maryland on April 3.

COAA president, Joseph Huang, first gave a COAA 2004 report, and vice-president Da-Lin Zhang reported the COAA Beijing conference preparation status. There were eleven oral presentations covering a wide range of climate, atmosphere, and ocean topic. Drs. Fu-Lung Chang and Menglin Jin are winners of the two best presentations. They will each receive $200 towards purchasing their airplane tickets to attend COAA2004 Conference in Beijing this summer.

Xiaofeng Li and Zhanqing Li, Program Co-Chairs

(Workshop abstracts are published in item 5 below)

(2) Announcement of the International Symposium on Tropical Weather and Climate

The International Symposium on Tropical Weather and Climate co-sponsored by COAA will be held in GuangZhou, China, from Nov. 7-11, 2004. The complete announcement has been published online at http://www.coaaweb.org. Please visit this COAA website for details.

(3) Community News

More new members have joined COAA! Let's extend our warmest welcome to:

Samuil A. Rybak,Andrey –Acoustics Institute Russian Academy of Science – Nonlinear wave theory, Ocean acoustics
Xinan Liu – University of Maryland, Physical Oceanograph – ocean sciences
Huiling Yuan – University of California, Irvine.
Jingli Yang – ERT, Inc., Maryland – Satellite system, Earth Sciences
Qingfang Jiang – Naval Research Laboratory, Monterey, CA – Orographic precipitation, Gravity wave dynamics.
Zuojun Yu – IPRC/University of Hawaii – Physical Oceanography
Shuhui Wang - University of California, Los Angles
Ruixin Yang – George Mason University, Virginia

(4) Job Opportunities

4a. The Laboratory for Atmospheres at NASA's Goddard Space Flight Center in Greenbelt, Maryland, is offering positions in atmospheric processes and climate change. Focal areas include mesoscale, cloud system and chemical transport modeling, aerosol remote sensing, atmospheric radiation, climate diagnostics and climate process modeling. The positions are U.S. Civil Service term appointments, analogous to university tenure-track positions, and may lead to career civil service appointments. US citizenship is required. Details including instructions for applying, can be found at http://atmospheres.gsfc.nasa.gov/.

4b. National Taiwan Ocean University, Department of Oceanography is pleased to announce the availability of 1-2 faculty positions. This search is targeted to those with a Ph.D. in physical oceanography or related field. Applicants should have an experience with in-situ ocean observations. Candidates should be able to teach courses related to oceanic information system. To apply, please mail by May 30, 2004 your curriculum vita, a brief description of teaching and research interests, a set of publication reprints, and three references to:

Dr. Chung-Ru Ho
Chair, Department of Oceanography
National Taiwan Ocean University
2 Pei-Ning Road, 202, Keelung, TAIWAN
Tel: +886-2-24622192 ext. 6331
Fax:+886-2-24621047
Email: b0211@mail.ntou.edu.tw

4c. FM Global Research has an opening. The position will be responsible for planning and conducting research regarding climatology/meteorology of windstorms and precipitation worldwide. Responsibilities include:

* Analyzing data to identify trends in intensity, frequency and other attributes that contribute to property loss
* Evaluating and modifying computer models for property loss from natural catastrophes.
* Preparing reports and presentations that describe the studies conducted and the importance of the results for loss prevention and risk management.

Position Requirements:

* Significant research record in a relevant field of climatology/meteorology.
* Knowledge of mathematical modeling, probability and statistics.
* Demonstrated project management skills.
* Excellent written and verbal communication skills.
* PhD with 7+ years or MS with 12+ years of experience in wind storm/rainfall climatology/meteorology

Remember to include the job code FM1123 in all correspondence about this position. If you are interested, please contact Dr. liming Xu for further information.

Liming (Larry) Xu
FM Global Research
Phone: 781-255-4945

(5) Research Abstracts presented at the COAA Spring Workshop

• Potential Predictability of U.S. Summer Climate with "Perfect" Soil Moisture

Fanglin Yang, GEST/UMBC, Climate and Radiation Branch, NASA Goddard Space Flight Center, Greenbelt, Maryland. E-mail: fyang@climate.gsfc.nasa.gov
Arun Kumar, Climate Prediction Center, National Centers for Environmental Prediction, Washington D.C.
William K.-M. Lau, Laboratory of Atmospheres, NASA Goddard Space Flight Center, Greenbelt, Maryland

The potential predictability of surface-air temperature and precipitation over the United States continent was assessed for a GCM forced by observed sea surface temperatures and an estimate of observed ground soil moisture contents. The latter was obtained by substituting the GCM simulated precipitation, which is used to drive the GCM's land-surface component, with observed pentad-mean precipitation at each time step of the model's integration. With this substitution, the simulated soil moisture correlates well with an independent estimate of observed soil moisture in all seasons over the entire US continent. Significant enhancements on the predictability of surface-air temperature and precipitation were found in boreal late

spring and summer over the US continent. Anomalous pattern correlations of precipitation and surface-air temperature over the US continent in the June-July-August season averaged for the 1979-2000 period increased from 0.01 and 0.06 for the GCM simulations without precipitation substitution to 0.23 and 0.31, respectively, for the simulations with precipitation substitution. Results provide an estimate for the limits of potential predictability if soil moisture variability is to be perfectly predicted. However, this estimate may be model dependent, and needs to be substantiated by other modeling groups. A long-term archive for Argo data, developed at the U.S. National Oceanographic Data Center (NODC), is presented in this paper. Argo data include real-time and delayed-mode profiles of ocean temperature and salinity (and conductivity, if any) measured by the Argo profiling floats. The purpose of this paper is to describe the development of a system for acquiring, preserving, and disseminating Argo data and information to the public.

In the year 2000, a global array of approximately 3,000 free-drifting profiling floats, known as the Argo Ocean Profiling Network, was planned as a major component of the ocean observing system. Argo originated from the need to make climate predictions on both short and long time scales and has led to international participation and collaboration to ensure global coverage. Centers to handle the data collected by profiling floats have been established in a number of countries. All Argo data are publicly available in near real-time via the GTS (Global Telecommunications System) and in scientifically quality-controlled form with a few months delay.

Dr. Fanglin Yang received a B.S. in 1989 and a M.S. in 1992, both in meteorology in China. Starting from 1994 he spent six years at University of Illinois at Urbana-Champaign, working as a research assistant while he was pursing a Ph.D. degree in atmospheric sciences. After receiving his degree in January 2000, Dr. Yang moved to Washing D.C. and worked at the National Centers for Environmental Prediction for three years. He joined the Climate and Radiation Branch at GSFC/NASA in December 2002. In general, Dr. Yang's research is focused on climate modeling and diagnosis, utilizing atmospheric and oceanic general circulation models (GCM) as the principle tool, supplemented by statistical methods and low-dimensional numerical models. His past research covers investigations of radiative forcing and climate changes induced by volcanic aerosols and greenhouse gases, development of atmospheric GCMs, and prediction and diagnosis of climate in seasonal to interannual time scale forced by anomalous boundary conditions associated with SST, snow and soil moisture. Please visit http://crgd.atmos.uiuc.edu/~fanglin/ for more information.

- **Validation of range correction algorithm using real-time radar data from sterling, va**

Feng Ding, RS Information Systems/Hydrology Laboratory, Office of Hydrologic Development, National Weather Service, NOAA, Silver Spring, Maryland. Email: feng.ding@noaa.gov
Dong-Jun Seo and David H. Kitzmiller, Hydrology Laboratory, Office of Hydrologic Development National Weather Service, NOAA, Silver Spring, Maryland

The nonuniform vertical profile of reflectivity (VPR) is considered one of the most important sources of range-dependent biases in WSR-88D precipitation estimates. The Range Correction Algorithm (RCA), which has been developed by the Office of Hydrological Development, National Weather Service, aims to reduce such range-dependent biases. The RCA functions by estimating an areal mean VPR through volumetric scanning. This VPR is then used to estimate surface-level rainfall rate in regions where the lowest radar beam intersects the melting layer or other elevated regions where the hydrometeor distribution is different from that immediately above the surface. The RCA is currently being implemented in the Open Radar Product Generator system.

A prototype of the RCA has been operating for several months in early 2003, using real-time radar data from the Sterling VA radar site. The purpose of this effort is to evaluate whether RCA consistently enhances the accuracy of precipitation estimates under the circumstances of real-time operations, and to develop operational guidelines for the use of RCA. We will present validation results showing the effects on range correction on 24-hour rainfall estimates verified by comparison with rain gauges in the cooperative observer network. We have found that in the winter and early spring (February-April), when precipitation is mainly from stratiform systems, the RCA consistently reduces range-dependent biases in the precipitation estimates. The improvement is realized mainly by correcting overestimates within the

bright-band region and underestimates at longer ranges. However, in situations where the precipitation is a mixture of stratiform and convective types, the improvement is not as pronounced or consistent.

Work Experience: Jan. 2002 - present: Meteorologist, RS Information Systems/Hydrology Laboratory, Office of Hydrologic Development, NOAA-NWS, Silver Spring, MD. Radar meteorology, multi-sensor precipitation estimation, etc..
Aug. 1996 - Jul. 2000: Research Assistant, Dept. of Marine, Earth and Atmospheric Science, North Carolina State University, Raleigh, NC; Large-eddy simulations of the atmospheric boundary layer and aircraft wake vortex; Mar. 1990 - Aug. 1996: Research Assistant, Chinese Academy of Meteorological Sciences, Beijing, China; Satellite meteorology, radar meteorology, and precipitation estimation.
Education: M.S., Computer Science, December 2001. The George Washington University, Washington, DC.; Ph.D., Atmospheric Science, July 2000. North Carolina State University, Raleigh, NC; M.S., Atmospheric Physics, March 1990. Chinese Academy of Meteorological Sciences, Beijing, P. R. China; B.S., Atmospheric Physics, July 1987. Peking University, Beijing, P. R. China.

- **Impacts of Satellite Measured Precipitation on GEOS Assimilation System**

Song Yang and Li Tao, George Mason University, Fairfax, VA, NASA/GSFC, Greenbelt, MD
Email: ysong@agnes.gsfc.nasa.gov

The NASA/GSFC Data Assimilation Office (DAO) general circulation model (GCM) assimilations (GEOS) with surface precipitation from satellite passive microwave measurements for May-August 1998 and its control assimilations without the measured surface rainfall will be analyzed to evaluate impacts of measured rainfall on GEOS assimilation system. The outgoing longwave radiation (OLR) and ECMWF datasets for the same time period are also used in this study. The 40°N-40°S global area which is the coverage of the Tropical Rainfall Measuring Mission (TRMM) is our focused region. The Madden-Julian oscillation (MJO) phenomena of atmosphere, especially in Asia summer monsoon region, have been investigated. Results show positive impacts of measured rainfall on GCM assimilations. Results also help us in understanding the mechanist of MJO activities. Better MJO features from the GCM data assimilation could lead to future improvements on GCM parameterization schemes and eventually improve GCM performances.

Dr. Song Yang received a B.S. in Meteorology from Nanjing Institute of Meteorology in 1983, and a M.S. in Tropical Meteorology from Zhongshan University in 1986, and a Ph.D. in Satellite Meteorology from Florida State University (FSU) in 1997. He worked as Postdoctoral scientist at FSU for two years. He took a research faculty position in the Joint Center for Earth Science and Technology (JCET) from 1999 to 2001 and in the Goddard Earth Science and Technology Center (GEST) from 2001-2003 in University of Maryland Baltimore County. He Joined George Manson University as a Research Associate Professor in October 2003. Dr. Yang have participated in many satellite-related projects, especially the Tropical Rainfall Measuring mission (TRMM) and the Global Precipitation Measurement (GPM) mission. His primary research interests are remote sensing of precipitation and latent heating, tropical convective systems and climate change, and applications of remote sensing on data assimilations.

- **Developing and Characterizing Cloud Vertical Structures Using Satellite Data**

Fu-Lung Chang. Earth System Science Interdiciplinary Center,University of Maryland, College Park
Email: fchang@essic.umd.edu

The distributions of cloud, both vertically and horizontally, dominate the earth's radiation budget and climate. This study examines the global and regional cloud vertical structures and their geographic distributions using Terra/MODIS data. A novel cirrus-overlapping-low-cloud retrieval method has been developed and applied to the daytime MODIS data obtained in January, April, July, and October 2001. Results showed that, of the total cloud amount, high clouds with cloud top pressure (Pc) < 500 mb occurred in ~50% (65%) over ocean (land), while high clouds that were thin cirrus (infrared emissivity < 0.85) occurred in ~34% (46%). The low clouds with Pc > 620 mb occurred in ~74% (68%) over ocean (land), which had ~46% (28%) being single-layered low clouds and ~28% (40%) being underlying high clouds. Mid-cloud Pc between 500-620 mb showed a minimum of less than 3%. The newly-developed global cloud climatology would help understand cloud dynamical and radiative processes and improve cloud modeling in climate study.

Dr. Fu-Lung Chang is currently an Assistant Research Scientist at University of Maryland in the Earth System Science Interdisciplinary Center (ESSIC). He came to ESSIC in 2001 after working as a researcher at the Canada Centre for Remote Sensing. He is now focused on developing satellite cloud retrievals, and on enhancing the use of both satellite data and ground measurements from the DOE/ARM program. Dr. Chang has his BS from National Taiwan University and MS and PhD from Oregon State University, all in Atmospheric Sciences.
Faculty research associate, March 2004-, ESSIC, University of Maryland
Assistant Professor, Fall 2002-March 2004 Institute of Atmospheric Physics (IAP), Chinese Academy of Sciences (CAS).
Research Associate, Fall 1999-Fall 2002, Institute of Atmospheric Physics (IAP), Chinese Academy of Sciences (CAS).
Research Associate, Fall 1997-Fall 1999, Institute of Tianjin Meteorological Sciences.
Research Assistant, Spring 1995-Summer1997, Chinese Academy of Meteorological Sciences (CAMS).

- **Validation of MODIS aerosol optical depth and evaluation of potential cloud contamination in East Asia**

XIA Xiang-Ao, LAGEO, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, 100029. E-mail: **xxa@mail.iap.ac.cn**

MODIS aerosol optical depths onboard Terra/Aqua and ground truth data derived from AERONET (Aerosol Robtic Network) solar direct radiance measurements are collocated to evaluate the quality of the former in East Asia. AERONET stations in East Asia are separated into two groups according to their locations and the preliminary validation results for each station. The validation results show that there remains much space to improve the MODIS aerosol retrievals in East Asia. This is demonstrated by relatively small slopes and relatively large intercepts of the linear relation between MODIS and AERONET aerosol optical depth. One of reasons is due to the improper aerosol model used in MODIS aerosol retrieval algorithm since the slopes are much less than unit, so it's significant to characterize aerosol properties properly according to the long term ground-based remote sensing or other relevant in situ observations in order to improve MODIS retrievals in East Asia. Cloud contamination remains one of large errors, which is demonstrated by the significant relation between MODIS aerosol retrievals versus cloud fraction as well as the notable improvement of linear relation after potential cloud contamination is screened. Consequently, it's suggested that more stringent clear sky condition should be set in use of MODIS aerosol data. But it should be pointed out that the improvement might be offset by other error sources occasionally because there is a complex relation between different errors. In addition, large seasonal variation of surface reflection and uncertainties associated with it result in large intercepts and random errors in MODIS aerosol retrievals in northern inland of East Asia.

PhD. Institute of Atmospheric Physics (IAP), Chinese Academy of Sciences (CAS). Advisor: Prof. Wang, Mingxing. Dissertation: "Analysis of dust aerosol properties over North China". **MS** in the effect of climate change on agriculture, Chinese Academy of Meteorological Sciences (CAMS). MS thesis: "Model study of climate change effects on spring maize growth over Northeast China", Advisor: Prof. Wang, Futang. Graduated in June 1997. **BS** in Application Meteorology, Nanjing Institute of Meteorology (NIM). July 1994

- **Potential Mechanism for Response of ENSO Variability to Change in Land Surface Energy Budget**

Zeng-Zhen Hu , Center for Ocean-Land-Atmosphere Studies, 4041 Powder Mill Rd.,
Suite 302, Calverton, MD 20705. E-mail: hu@cola.iges.org
Edwin K. Schneider, George Manson University, Fairfax, VA 22030, and Center for Ocean-Land-Atmosphere Studies, Calverton, MD 20705
Uma S. Bhatt, International Arctic Research Center, Frontier Research System for Global Change, University of Alaska, 930 Koyukuk Dr., P. O. Box 75-7335, Fairbanks, AK 99775
Ben P. Kirtman, George Manson University, Fairfax, VA 22030, and Center for Ocean-Land-Atmosphere Studies, Calverton, MD 20705

El Nino and Southern Oscillation (ENSO) variability was found to be sensitive to the land surface energy budget from a comparison of two integrations of the coupled general circulation model of Center for Ocean-Land-Atmosphere Studies, a control simulation in which global soil wetness in the three layers is predicted, and a sensitivity experiment in which deep soil moisture is specified. In contrast to the control

experiment, in which the net land surface energy flux is zero, the sensitivity experiment leads to land becoming a unphysical and unexpected net energy sink. However, the comparison points towards a physically realizable mechanism by which ENSO can be influenced by changes in land surface properties.

The net energy sink causes cooling tropical land surface. The cooling over tropical land is connected with the mean state changes of the coupled system, including a shift in the land/sea partitioning of precipitation toward the oceans, a more westerly wind stress over the tropical Pacific, and a more El Nino-like mean state of the tropical Pacific with a weaker east-west temperature contrast. Meanwhile, sea surface temperature (SST) variance decreases in the central and eastern tropical Pacific, and the ENSO becomes less energetic. A series of diagnostic simulations using an intermediate coupled model tests the impact of the simulated mean state and atmospheric noise changes on the ENSO variability. It is demonstrated that the mean state change plays a key role in determining the ENSO variance change. The mean state change in the sensitivity experiment causes a reduction in the sensitivity of ENSO SST variability to surface wind stress, and is consistent with a decrease in ENSO SST variance.

Z.-Z. Hu, Ph.D., Peking University, 1991, Research Scientist. Dr. Hu is working on climate variability and predictability problems. He is also interested in the Asian monsoon study and climate change forced by future greenhouse warming. Before joining COLA, Dr. Hu was a visiting associate Professor at CCSR of the University of Tokyo, Tokyo, Japan, for one year (1995-1996), a visiting scientist of Max-Planck Institute for Meteorology, Hamburg, Germany, for two years (1998-2000), and an associate professor at Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China**.**

- **Using Hyperspectral Imaging to Help Study Algal Blooms in Chesapeake Bay**

Yixiang Nie, Ruixin Yang, School of Computational Sciences, George Mason University. E_mail: ynie@gmu.edu
Ed Gross, StormCenter Communications, Inc.

Hyperspectral analysis gives us the ability to extend beyond the estimation of phytoplankton biomass in order to determine algae population composition. In this study, we focused on an algal bloom event in the upper Chesapeake Bay area. Using EO-1 Hyperion hyperspectral data, combined with station observations and MODIS and airborne sensor derived chlorophyll concentration, it provides us a new approach for the detection and monitoring of harmful algae blooms such as red tides, and helps us study algal bloom events related to nutrient enrichment and environmental perturbations. This study is also a preparation for the building of the spectral library for the harmful algae blooms in Chesapeake and Coastal Bays.

Hyperspectral imaging offers a new tool in the study of algal blooms in our Bays. Merging remote sensing technologies with traditional Bay monitoring programs will allow natural resource managers, local authorities and the public to better understand, evaluate, preserve and restore the health of our Chesapeake and Costal Bay waters and habitats.

Yixiang Nie received his B.S. in Computer Science from the Dalian University of Technology, China in 2000 and M.S. in Computational Sciences from George Mason University in 2003. Currently, he is a Ph.D. student majoring in Remote Sensing at the Center of Earth Observing and Space Research,School of Computational Sciences, George Mason University and member of the Envirocast Team at the Stormcenter Commuications Inc.. His research interests include hyperspectral imaging, nonlinear spatial-temporal data analysis and scientific visualization

- **Detecting and Simulating Urban-induced Climate Changes via EOS observations and NCAR Community Land Model**

Menglin Jin, Department of Meteorology, University of Maryland, College Park
Email**:** mjin@atmos.umd.edu

Advanced EOS observations provide us an unique opportunity to detect and simulate urban induced climate changes. Using 5km EOS MODIS-observed skin temperature, land cover, albedo, emissivity,

LAI, aerosol optical depth, and cloud properties, we examine the surface-atmosphere interactions and urban heat island effects from selected big cities (New York, Beijing, Phoenix, and Houston) to global coverage. These analyses address physical processes modified by urban constructions as well as the general features of urban climate. We find the largest urban impacts in terms of temperature are observed over 30-60N, where most cities are located. In addition, urban regions overall decrease surface albedo by 3-5% and decrease surface emissivity by 1-2%. Focusing on Houston, we develop an urban scheme and couple it into NCAR Community Land Model (CLM-urban) to simulate urban climate. CLM-urban can improve the simulation of water and energy cycles over Houston with the use of observed LAI, albedo and emissivity, as well as urban thermal properties.

1999-present: Department of Meteorology, University of Maryland, College Park; 1999: Ph.D. from University of Arizona
1995: M.S. from University of Arizona

- **Diagnostic Studies of Recent Variations of Oceanic Evaporation Using Satellite Data**

Yukun Xing, SCS/CEOSR, George Mason University, Fairfax VA 22030-4444. Email: yxing@gmu.edu
Long S. Chiu and Alfred T-C. Chang, NASA/GSFC, Code 974, Greenbelt Maryland 20771

We examined the GSFC Sea Surface Turbulent Flux version 2 data (GSSTF2) and found two modes of variations in latent heat flux. One mode is associated with an enhance Hadley and Walker circulation and the other is associated with the El Nino Southern Oscillation (ENSO). The current work examines the causes of the previously identified patterns of variation in the GSSTF2 data. Variance study shows that both the sea-air humidity difference (DQ) the wind speed (WS) are important contributors to the variance of the latent heat flux. However, by comparing the contributions of the two, it is concluded that the wind speed contributes more in the tropics while DQ contributes more in the extra-tropic areas. The same method shows that the surface air humidity (Qa) is the dominant factor in the variation of DQ. Both the EOFs of Qa and WS have an increasing mode while for Qa there is also an ENSO mode. Overall Qa plays an important role in the observed variation in latent heat flux. A recent study shows that Qa causes most of the inaccuracy in the satellite derived J-OFURO (Japanese Ocean Flux Data Sets with Use of Remote Sensing Observations) data, which is a data set very similar to the GSSTF data. Using buoy data at several locations, we show that the drifting satellite orbits could have caused some bias in the observation. We are examining the use of the AIRS (Atmospheric Infrared Sounder) water vapor profile to improve our estimate of oceanic latent heat flux.

Yukun Xing received his B.S. degree in Electrical Engineering form Tsinghua University and is currently a Ph. D. candidate at the School of Computational Science, Earth Systems and geoInformation Science program. He examined rainfall variability associated with ENSO and diurnal rainfall variabilities. His thesis examines the global hydrological cycle components and focuses on diagnostic studies of oceanic evaporation from remote sensing techniques.
Ph.D. Student from CEOSR (Center for Earth Observing and Space Research)/School of Computational Sciences, George Mason University

- **Laboratory Measurements of Low-Grazing-Angle Radar Backscatter and Crest Profile of Breaking Waves**

Xinan Liu, University of Maryland; Mark Sletten, Naval Research Laboratory; James H. Duncan, University of Maryland

The radar backscatter features from breaking waves at low grazing angle and the wave crest profiles are simultaneously measured in the tank that is 14.8 m long, 1.2 m wide with the water depth of 0.91 m. The waves with three different wavelengths were generated mechanically via a dispersive focusing method and the breaking intensity of these waves varied from weak spilling to strong plunger. The radar backscatter was measured with an ultrawideband, short-pulse radar with a range of resolution of approximately 3 cm in wave crest region. Both horizontally and vertically polarized backscatter was collected on an interleaved, pulse-to-pulse basis. The wave crest profile history at the center plate of the tank was measured with a photographic technique

that employs a high-speed camera, a laser sheet and fluorescent dye. Our measurements show that the radar signatures are strongly correlated to the intensity of wave breaking. Also, it is found that the plunging jet produces interesting backscatter and polarization characteristics.
This work is supported by the Office of Naval Research under Grant N000140210656

Xinan Liu got his B.S in Mathematics from Jilin University in1986, M.S. in Physical Oceanography from Ocean University of Qingdao in 1989, and Ph. D in Mechanical Engineering from University of Maryland, College Park in 2002 Currently, he is Research Associate (post-doc) with Department of Mechanical Engineering, University of Maryland

- **The Flying-leap Experiment and the Earth System Model at University of Maryland**

Ning Zeng, Department of Meteorology and Earth System Science Interdisciplinary Center, University of Maryland. Email: zeng@atmos.umd.edu

A comprehensive intermediate Earth system model is used to study the interactions among climate, the carbon cycle, and terrestrial and marine ecosysystems. The model takes a balanced approach to simulate the complexities in each model component in order to facilitate our focus on the interactions among the subsystems, which encompass the atmosphere, land surface, vegetation, ocean circulation, and ocean chemistry and biology. Examples will be given on vegetation-climate interaction in semiarid regions, the interannual variability of carbon sources and sinks, and the glacial-interglacial CO2 problem.

Ning Zeng is an assistant professor of Meteorology and ESSIC. His research focuses on climate variability and hydrological cycle. He is also interested in how the Earth's carbon cycle and biosphere interacts with climate from seasonal to glacial-interglacial time scales. Prior to joining UMCP in 2001, Ning was at MIT, UCLA, NASA Goddard Space Flight Center, and the Max-Planck Inst. for Meteorology. Ning had a master degree in astrophysics, and doctorate in atmospheric sciences from the University of Arizona. Expertise: Climate, land-atmosphere interaction, carbon cycle