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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  
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**(1) Annual COAA Meeting Held at the University of Maryland, October 23, 2004**

The Annual Meeting was opened with a report by COAA President, Dr. Joe Huang, on the past year's accomplishments that included meetings sponsored by COAA and work done on updating the bylaws and developing a financial operational guideline. Dr. Huang also strongly encouraged networking and tutoring by more senior COAA members and stressed the unique position of COAA as a bridge between scientists in the U.S. and the Chinese homeland. Next, COAA Treasurer, Dr. Chung-Lin Shie, spoke about the financial operational guideline that the Board recently developed to guide spending, in particular, with regard to cosponsoring meetings with other professional organizations. The guideline in its summary form (see below) was presented and was unanimously approved by the members at the meeting. The final business of the meeting was the selection of four new Board Directors to replace the four outgoing Directors, Da-Lin Zhang, Chung-Lin Shie, Xiaofeng Li, and Colin Shen. The following four members - Long Chiu, Menglin Jin, Henry Juang, and Sarah Lu, were nominated and unanimously approved at the meeting to serve as new Directors. (Their biographical information will be published in the next issue of COAA Newsletter.) The rest of day was devoted to scientific presentations. All presenters showed great care in their preparations and gave informative high quality talks. Vigorous discussions followed each talk. Three Ph.D. students, Yixiang Nie, Jun Shen and Wen Long, should be particularly congratulated for their excellent presentations. The abstracts of all speakers are given at the end of this e-Newsletter.

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Operational Guideline for Cosponsoring a Meeting With Another Organization

Purposes: To ensure that COAA's interests are well served in the cosponsored meeting and that expenditures in support of the meeting stay within the budget set by the COAA Board. Criteria: To qualify as a cosponsored meeting, the meeting must be organized by one or more COAA members and open to all COAA members, and its theme must be related to oceanography and/or meteorology. The principle organizer for COAA is required to submit a proposal, detailing the meeting's program and budget, for approval by the COAA Board. Approval: The proposal must be approved by 2/3 of the Board members. Post-meeting report: The principle organizer must submit a post-meeting report that documents COAA's roles in the meeting and expenditures in support of the meeting.

**(2) IMAS Meeting – Second Announcement**

9th Scientific Assembly of the International Association of Meteorology and Atmospheric Sciences (IAMAS)  
of the International Union of Geodesy and Geophysics (IUGG) Beijing, China, August 2-11, 2005  
PAGES' 2nd Open Science Meeting August 10-12, 2005  
<http://www.iamas2005.com> and <http://web.lasg.ac.cn/IAMAS2005>

The International Association of Meteorology and Atmospheric Sciences (IAMAS), which is one of the seven scientific associations making up the International Union of Geodesy and Geophysics (IUGG), will hold its biennial Scientific Assembly in Beijing, China from 2-11 August 2005. The theme of the conference is The Fascinating

Atmosphere: Changeable and Changing, and will cover all areas of meteorology and atmospheric sciences, including dynamics, radiation, chemistry, electricity, clouds and precipitation, and climate variability and change.

The Second Circular and call for papers has been released (see <http://web.lasg.ac.cn/IAMAS2005/> or <http://www.iamas2005.com>). The circular describes the topics and lists the conveners for 45 symposia that will cover aspects affecting the surface to the middle atmosphere and low to polar latitudes. The International Commission on Snow and Ice and the International Association of Hydrological Sciences are leading the organization of several of the symposia. Special IAMAS symposia are also planned to celebrate the contributions to meteorology of Senior Academician Prof. Ye Duzheng in honor of his 90th Birthday, and to provide an opportunity for lead authors of Working Group I of Intergovernmental Panel on Climate Change (IPCC) to report on progress on the Fourth Assessment Report at the approximate time that the initial chapter drafts are to begin their technical review.

IAMAS 2005 is also being held in conjunction with the Second Open Science Meeting of IGBP/PAGES, which will be held in the same facility in Beijing from 10-12 August 2005 and is entitled Paleoclimate, Environmental Sustainability and Our Future. The main aim of this meeting is to encourage international collaboration and interdisciplinary science, and to increase the visibility of paleoclimate research in Asia. More information can be found at <http://www.pages2005.org/>. The IAMAS and PAGES meetings will take place at the Beijing International Convention Center under the sponsorship of China's leading associations and societies of meteorology and atmospheric sciences. The local organizing committee is chaired by Dr. Guoxiong Wu of the Chinese Academy of Sciences and co-chaired by Dr. Guoguang Zheng of the China Meteorological Administration. As described in the Second Circular and on the Web site, pre- and post-conference tours will be available, as well as a mid-conference tour of Beijing. Information on partial travel grants for young scientists and those from countries in need is also available at the Web site, and applications for such grants are due by 25 February 2005.

Abstract submission can be done electronically on the IAMAS 2005 Web site. The IAMAS abstract deadline is 25 February 2005. Registration can also be done over the Web, and early bird registration is available until 1 June 2005.

### **(3) Community News**

**3a.** Prof. Ming-Xia He, Director of Ocean Remote Sensing Institute National laboratory, Ministry of Education, from Qingdao, China visited government agencies and universities in the Washington D.C. area during October 6 and 7, 2004. Specifically, she met with scientists from NOAA/NESDIS, NASA/GSFC, University of Maryland/ESSIC, and Johns Hopkins University/APL, to discuss scientific problems and future cooperation plans. Prof. He has many COAA friends in the area since she has previously visited NOAA for about 6 months in 1998. Members of COAA held a dinner party for her on October 6 to welcome her visit to DC. (Reported by Tao Du, [taodu@udel.edu](mailto:taodu@udel.edu))

**3b.** Congratulations to our COAA member Dr. Fuzhong Weng who has recently been promoted as the Chief of Sensor Physics Branch, NOAA/NESDIS/Office of Research and Applications. He will lead this branch to work on (a) satellite instrument calibration, (b) advanced satellite products for weather and climate applications, (c) satellite data assimilation to improve weather predictions, and (d) future satellite observing system.

Dr. Weng graduated from Nanjing Institute of Meteorology (now called "Nanjing University of Information Science and Technology") in 1985 with an M.S. degree. He came to the U.S. in 1987, and received his Ph.D. degree in 1992 from the Department of Atmospheric Science, Colorado State University. Since then, he has been working in NOAA/NESDIS, initially as contractor, a visiting scientist and then a government employee.

Dr. Weng is a leading expert in developing various NOAA operational satellite microwave products and algorithms such as Special Sensor Microwave Imager (SSM/I) and Advanced Microwave Sounding Unit (AMSU) cloud and precipitation algorithms, land surface temperature and emissivity algorithms. He developed a comprehensive technique in simulating microwave land, snow and sea ice emissivity. Because of his outstanding achievements, he was the first winner of the 2000 NOAA David Johnson Award, and he received 2002 SPIE Scientific Achievement Award for Excellence in Developing Operational Satellite Microwave Products and Algorithms. In 2002, he was appointed by NESDIS as the deputy director of Joint Center for Satellite Data Assimilation. He has published nearly 30 papers in the international journals. (Reported by Da-Lin Zhang, [dalin@atmos.umd.edu](mailto:dalin@atmos.umd.edu))

### **(4) COAA 2004 Annual Meeting – Scientific Presentations**

#### **Introduction**

Dear Participants:

On behalf of the organizing committee, we would like to welcome you to the COAA 2004 annual meeting. 10 papers will be presented, covering data analysis, modeling, remote sensing and algorithm development of atmospheric, oceanic and research and applications.

The committee member have worked hard to produce a balance program, negotiated a good menu for the conference dinner, and most of all, have worked collegial and coming up to the challenge whenever needs arise, making the organizing of this meeting a truly enjoyable experience.

We thank the Department of Meteorology of University of Maryland for hosting this meeting and Yixiang Nie for producing the conference program in its present form.

This annual meeting also concludes Xiaofeng Li's 2-year term as COAA board program director. He wishes the best luck to future COAA program.

Have a good meeting!  
Xiaofeng Li and Zhanqing Li

### Abstracts

#### **1. Validation of TRMM PR Measurements and Estimates**

**Liang Liao.** Goddard Earth Sciences & Technology Center/Caelum, Greenbelt, MD 20771  
Robert Meneghini Code 975, NASA/GSFC, Greenbelt, MD 20771

The TRMM Precipitation Radar (PR), which operates at a frequency of 13.8 GHz and measures rain from space, is subject to attenuation while propagating in rain, partially melted hydrometeors and water clouds. The correction for attenuation is a crucial procedure in order to accurately estimate rain rate. Validating the TRMM PR measurements and estimates and examining some of TRMM standard algorithms require comparisons with well-calibrated non-attenuated ground-based radar measurements. The relative calibration accuracy of the radars is evaluated by checking the reflectivities at the storm top, where the PR attenuation is negligible. Near the surface, where the PR attenuation effects can be significant, the data are used to assess the performance of the PR attenuation correction algorithm. In this study the ground-based measurements are taken from the S-band WSR-88D radar during the TRMM satellite overpasses over the Melbourne, Florida site during times when significant precipitation was present in the overlap region of the PR and WSR-88D. Resampling the PR and WSR-88D data sets to a common high-resolution grid provides a means by which the radar reflectivity factor can be compared at different heights and for different rain types over ocean and land. The comparisons are also made for the surface rain, area-averaged rain and classification of storm types. The statistical parameters of mean and standard deviation will be given for the evaluation of the PR products. In this study the version 5 and 6 data of the PR are used while the version 5 WSR-88D data are available for all the comparisons.

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1982-1985: M.S. in Space Physics, Wuhan University, P.R.China.

1978-1982: B.S. in Electrical Engineering, Wuhan University, P.R.China.

EMPLOYMENT: 1994-present:Goddard Earth Sciences and Technology Center/Caelum Research Corp. Senior Scientist/Team Leader

1987-1993:University of Utah, Salt Lake City, Utah, Department of Meteorology, Graduate Research Assistant

1985-1987:Wuhan University, Wuhan, China, Department of Space Physics, Assistant Professor

PROFESSIONAL ASSOCIATIONS: Member of the American Meteorological Society, American Geophysical Union, and IEEE.

RESEARCH INTERESTS: Simulations of the microwave propagation and scattering through atmospheric precipitation and hydrometers for the study of the radar measurements of precipitation and cloud. Development of algorithms of microwave radar for retrievals of hydrometer profiles. Modeling of radar bright band signatures associated with the melting region of hydrometers to understand the microphysical properties of the melting particles and their influences on wave propagation.

#### **2. Origin and Structures of a Major Turbid Water Plume in the East China Sea**

**Dongliang Yuan.** GES DAAC, NASA Goddard Space Flight Center, Greenbelt, Maryland  
Jianrong Zhu. State Key Laboratory of Estuary and Coastal studies, East ChinaNormal University  
Chunyan Li, Skidaway Institute of Oceanography, Savannah, Georgia  
Dunxin Hu. Institute of Oceanology, Academia Sinica, Qingdao, China.

A significant turbid water plume in the East China Sea is observed by the Moderate Resolution Imaging Spectroradiometer (MODIS) instrument on board of Terra satellite. The plume is found to originate from the

shallow waters along the coast of China north of the Yangtze River mouth and is not related to the discharge of the Yangtze River. In situ hydrography and flow measurements have confirmed that the Yangtze River water did not feed into the plume in winter 2001. A strong seasonal cycle of the plume evolution is observed. The plume expands in fall, maximizes in winter, shrinks in spring, and becomes coastally bonded in summer. Substantial interannual variations are indicated by the satellite observations as well. The large area of coverage in winter and the significant annual and interannual variations suggest that the plume has significant implications to the regional circulation and ecosystem.

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Dr. Yuan, Dongliang graduated from Beijing University Department of Mechanics in 1988 and received his M.S. degree in oceanography from Institute of Oceanology, Chinese Academy of Science in Qingdao, China. He got his Ph. D. degree from the Florida State University in 1995. His past experience includes studies of ocean circulation in the Asian marginal seas, in the Gulf of Mexico, off the east coast of the United States, and in the equatorial Pacific and Indian Oceans. His research interests are the dynamics and thermodynamics that control the variations of ocean circulation and sea surface temperature. His past position includes a postdoctoral position at Florida State University, a visiting scientist position at University Space Research Association, and an assistant research scientist position at University of Maryland, Baltimore County. He is currently holding a scientist position at Goddard GES DISC to support the scientific use of MODIS data.

### **3. Raising the Environmental I.Q. of Public**

**Yixiang Nie.** StormCenter Communications, Inc.

StormCenter is focusing on applying environmental science in such a way as to engage the public and to increase their understanding of the environment. It is a challenge to better utilize science information as a tool for improved public and agency decision making, to directly relate science to societal benefits, and to increase public environmental awareness so better decision making can be made in times of crisis.

In this presentation, I will briefly introduce how we process and deliver environmental issue related satellite imagery and stories to media and public. In addition, RealTrack™ will be further discussed. StormCenter Communications, Inc. and Accurate Environmental Forecasting, Inc. have teamed up to deliver this new hurricane forecast model that has been used at the National Hurricane Center and in some selected private industry locations for more than 5 years to public.

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EDUCATION: Ph.D. student, Remote Sensing, George Mason University, 2000 – present  
M.S., Computational Sciences, George Mason University, 2003.  
B.S., Computer Science, Dalian University of Technology, China, 2000

POSITION: Scientist, Geo-Information and Remote Sensing, StormCenter Communications, Inc.

EMPLOYMENT: Research assistant, Center for Earth Observing and Space Research, George Mason University, 2000 – 2004

Research assistant, Natural Language Processing Lab, Dept. of Computer Science,  
Dalian University of Technology, 1997 -- 2000

RESEARCH INTERESTS: Hyperspectral imaging, Nonlinear data analysis, Remote sensing of ocean pigments, Vegetation and climate change

### **4. Simulation of Diurnal Patterns of Summer Precipitation in the North American Monsoon: An Assessment Using TRMM**

**Cheng-Zhi Zou** and Weizhong Zheng, NOAA/NESDIS/Office of Research and Applications

The North American monsoon is an important climate feature of the southwestern U.S. and northwestern Mexico. Its particular precipitation characteristics have received great attention from both meteorologists and climatologists. The North American monsoon typically begins in early July and persists through the end of September, during which a belt of heavy rainfall occurs along the western slopes of Sierra Madre Occidental with an averaged rain rate exceeding 200 mm per month. The rainfall of this three-month period accounts for 60% to 80% of the annual total in the northwestern Mexico. The precipitation patterns over a large portion of the southwestern U.S. are affected by the North American monsoon. One of the major challenges in the current studies is to successfully simulate the diurnal cycle of precipitation in the North American monsoon. The diurnal cycle of precipitation is important since, in most cases, the diurnal amplitude of precipitation exceeds its daily mean during summer. In addition, the diurnal cycle of precipitation has large effects on surface hydrology and surface energy balance.

Recently, Zhang et al. (2003) have conducted a one-month continuous integration over Large-Scale-Area-East (LSA-E) using the Pennsylvania State University/National Center for Atmospheric Research (PSU/NCAR) Mesoscale Model Version 5 (MM5) coupled with the Simplified Simple Biosphere (SSiB) land surface model. During the integration, many daily characteristics of the weather evolution and diurnal cycle of precipitation over LSA-E were reasonably reproduced. Encouraged by these findings, this study simulates the diurnal pattern of the July 2002 precipitation in the North American monsoon in a continuous one-month integration using the coupled MM5-SSiB model.

The simulation is conducted in a two-way, nested grid with a resolution of 45 km for the coarse domain and 15 km for the fine domain and only the fine domain that covers the core region of the North American monsoon is analyzed. Comparisons with the conventional gauge-based observations show that the coupled model successfully simulates the strength, position, and orientation of the monthly mean heavy rainbelt along the western slopes of Sierra Madre Occidental. In addition, the spatial pattern and phasing of the diurnal cycle of precipitation in this region agrees fairly well with the satellite observations from the Tropical Rainfall Measuring Mission (TRMM).

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POSITION (2001-present): Physical Scientist, Office of Research and Applications (ORA), NOAA/NESDIS

EMPLOYMENT (1997-2000): Senior Scientist, QSS Group, Inc.

EDUCATION: PhD, 1995: School of Meteorology, University of Oklahoma

RESEARCH INTEREST: Climate studies using satellite and modeling

## **5. Response of Precipitation to Soil Moisture Constraints in the NCEP Global Model Simulations**

**Cheng-Hsuan Lu.** RS Information Systems, Inc., McLean, VA,  
and NOAA/NWS/NCEP EMC, Camp Springs, MD

This study presents the model results using the NCEP Global Forecast System (GFS). The NCEP EMC is among a dozen AGCM groups participating in the Global Land-Atmosphere Coupling Experiment (GLACE), an AGCM inter comparison study aimed to examine the degree to which the atmosphere responds to anomalies in land surface states. A total of three ensembles of GFS simulations are conducted for the 1994 boreal summer using observed SST throughout the integration. The first set is a typical AMIP runs. For the second set, each member is forced to maintain the same time series of surface prognostic variables. The third set is same as the second set except only deep soil moisture time series is forced to be identical among the member simulations.

The impact of prescribed land states on near surface fields is evident, e.g., latent heat flux time series shows great coherence among the members. However, the evolution of precipitation among the members shows a broad disparity and only a small fraction of the precipitation variance can be explained by soil moisture anomalies. In fact, the NCEP GFS is among these AGCMs that show very weak response of precipitation to prescribed land states. The lack of sensitivity of precipitation to soil moisture constraints is likely due to how the boundary layer mixing and moisture convection are formulated in the GFS

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EMPLOYMENT: Nov 2001 - present. Science/Programmer Analyst III, RSIS, McLean, VA, Work as a contract scientist for NCEP EMC

Sep 2000 - Sep 2001, Atmospheric Scientist, DSTI/RDC, Greenbelt, MD, Work as a contract scientist for NCEP CPC

May 1998 - Aug 2000, postdoctoral associate, Atmospheric Sciences Research Center, State University of New York at Albany, Albany, NY

January 1991 - May 1998, Graduate research associate, Atmospheric Sciences Research Center, State University of New York at Albany, Albany, NY

## **6. Recent Improvements to the Fast Transmittance Model, OPTRAN, for NOAA Data Assimilation**

**Xiaozhen Xiong,** QSS Group Inc., 4500 Forbes Blvd, Lanham, MD 20706, USA

Larry M. McMillin, Yong Han, Fuzhong Weng, Thomas J. Kleespies. Office of Research and Application, National Environmental Satellite, Data, and Information Service, NOAA, Camp Springs, MD 20746, USA

Paul Van Delst. CIMSS, University of Wisconsin-Madison

Here presented the most recent improvements to the fast and accurate transmittance-calculation procedure, Optical Path TRANsmittance (OPTRAN), which is used for satellite data assimilation in NOAA and used in physical retrievals by many users. One of the most important improvements is the introduction of a correction term to account for the polychromatic effect of the channel transmittance. This replaces the effective transmittance widely used in many current fast models. Use of the correction term solves some numerical problems that are associated with the use of effective transmittances, and greatly reduces the line-by-line computational burden, while allowing for the efficient inclusion of multiple gases. Other improvements include additional predictors, changes to the absorber space, treating the water continuum absorption separate from the water line absorption, as well as some procedures to reduce the number of coefficients for its implementation for data assimilation. Significant improvements are found in the ozone channels and the atmospheric window regions. Results of OPTRAN for High-resolution Infrared Radiation Sounders (HIRS), Atmospheric Infrared Sounder (AIRS), as well as other microwave sensors like SSMIS, AMSU are demonstrated.

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EDUCATION: Ph.D. Atmospheric Sciences, 2000. Geophysical Institute, University of Alaska Fairbanks, AK, USA

M.S. Atmospheric Physics, 1991. Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China

B.S. Atmospheric Sounding, 1988. Radar remote sensing and meteorological instruments, Chengdu Institute of Meteorology, Sichuan, China

AREAS OF EXPERIENCES AND RESEARCH INTEREST: Radiative transfer modeling; polar remote sensing; satellite retrieval of cloud and surface properties; retrieval of CO<sub>2</sub>, CH<sub>4</sub> and CO from satellite; greenhouse gases and climate change

## **7. Dynamics in Planetary Atmospheric Physics: Comparative Studies of Equatorial Superrotation for Venus, Titan and Earth**

**Xun Zhu.** The Johns Hopkins University Applied Physics Laboratory  
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A long-standing problem of the existence of equatorial superrotation in a rotating planetary atmosphere has been solved recently. The momentum budget that maintains stable superrotational winds in a given planetary atmosphere is examined systematically, comprehensively, and analytically. After reviewing general approaches of modeling studies of comparative planetary atmospheres, we describe the major dynamical processes that maintain stable equatorial superrotation for the atmospheres of Venus, Titan and Earth. Under appropriate conditions, all three planets could have equatorial superrotational winds greater than 100 m/s. Venus' equatorial superrotation of 118 m/s is maintained at its cloud-top level around 65 km. To have an equatorial superrotational jet stream for Titan's stratosphere, its main haze layer that absorbs solar radiation needs to be lifted to 0.1 mb. Strong equatorial superrotational winds for the Earth's atmosphere could be induced by optically thick dust clouds, following an asteroid impact. The Earth's superrotation can enhance meridional transport of the atmosphere, which could have accelerated the globalization of an environment unfavorable to the survival of the dinosaurs.

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## **8. The NCEP Flexible Global Atmospheric Model: Design and Preliminary Results**

**Hann-Ming Henry Juang.** Environmental Modeling Center, NCEP

A flexible modeling framework has been developed, it will be easily implemented in any elements of model codes, not also physics but also dynamics. Current NCEP global model has been separated into several elements and plugged into the framework to form a flexible global model (FGM). Further development to plug in other global models is planned. The elements of the model design and the concept of the model framework happens to be approximated to ESMF (Earth System Modeling Framework), though ESMF and FGM are developed independently.

Instead of fixed and detail rules and/or packages for users or modelers to follow. The FGM provides a concept and a method to build model super-structure. There is a simple rule to form a component of model. Each component

comprises three calls: In ESMF terms, they are initialized, run, and finalized. In practical use, they can be named any. In FGM, we use compound words for names, so we will know the relationship among calls, and the sequences etc. The main purpose of forming this kind of super-structure is to have capability to couple with other models or components. However, in order to communicate among three calls, a structured data type with pointer to pass through is designed. In this design, it is easy to change dynamics core and/or remove/add variables to the dynamics or physics package without to modify passing arguments. The structure data can be as a pointer without dimension in compiler, then the dimension is given by running time, for example, through FORTRAN namelist. Thus, one executable code can be used for different model resolution.

FGM has most capability of current global model, including MPI and reduced Gaussian grid structure. However, it has 2-D as well as 1-D decomposition for MPI, and a reduced spectral computation (Juang, 2004). It is so flexible that it can be run with any resolution and any MPI decomposition without re-compilation. The hybrid vertical coordinates to have flexible options for testing sigma, sigma-pressure, sigma-theta, and/or sigma-theta-pressure coordinates are under development.

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POSITIONS: Research Meteorologist, Environmental Modeling Center, National Centers for Environmental Prediction

### 9. A Grid-free Element Method for Gas Dynamics Simulation

**Jun Shen** and Peter Bernard. University of Maryland College Park, Department of Mechanical Engineering

A new grid-free Lagrangian dilatation element method for compressible flow has been developed in this research as an extension of incompressible vortex methods. It differs from grid-based numerical methods in a number of ways. The discretization is represented by a group of Lagrangian particles that are convected with the fluid flow velocities instead of a fixed spatial grid system. The velocities of the flow field, necessary in each time step to move the computational elements, are recovered from the dilatation distribution similar to the 'Biot-Savart' law used in incompressible vortex methods. The Fast Multi-pole Method (FMM) is used to speed up the process and reduce the cost from  $O(N^2)$  down to  $O(N \log N)$ . Each computational particle carries physical properties such as dilatation, temperature, density and geometric volume. These properties are governed by the Lagrangian governing equations derived from the Navier-Stokes equations. While the computational elements are convected in the flow, their properties are updated by integrating their corresponding governing equations. The spatial derivatives appeared in the Lagrangian governing equations are evaluated by using moving least-square fitting. The implementation of several different boundary conditions has been developed in this research. The results of applying the new grid-free dilatation method several compressible flow problems are compared with the solutions given by other proven numerical schemes. Good agreement of these results helps to establish the correctness of the present method.

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B.S., Jilin University China, July 1998

RESEARCH INTEREST: Computational fluid dynamics, turbulence modeling and simulation, heat transfer and thermal management, scientific computing, and micro/nano-fluidics.

### 10. Modelling Cross-shore Sediment Transport Processes With A Time Domain Boussinesq Model

**Wen Long.** Center for Applied Coastal Research, Univ. of Delaware

A phase-resolving sediment transport model is proposed by incorporating a time domain Boussinesq model and a wave boundary layer model for the purpose of looking for detailed cross-shore sediment transport mechanisms. The work is essentially to model sediment transport rate using instantaneous bed shear stress predicted from a detailed wave boundary layer model following Hsu et al (2004) and Justesen (1988) with free stream velocities obtained from Boussinesq model. Model is utilized to reproduce on shore sand bar migration events observed in DUCK94 field experiments. Relatively good agreement is achieved.

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AFFILIATION: Center for Applied Coastal Research, University of Delaware

EDUCATION: Master: Fluid Mechanics, Tianjin University, 2000

Bachelor: Engineering Mechanics, Tianjin University, 1997

RESEARCH INTEREST: Coastal/Ocean Engineering, Computational Fluid Dynamics, Sediment Transport, Waves and Currents,  
Environmental Fluid Mechanics