

Preliminary program:
29th International Liège Colloquium on Ocean Hydrodynamics
Liège, May 5-9, 1997
" Marine Turbulence Revisited "

MONDAY, May 5th, 1997

9.00 - 10.00 : Registration, Coffee, Display of posters

10.00 - 12.30 Session 1

Chairperson : A. ZATSEPIN

10.00 : *Lateral transport in the ocean surface mixed layer by Langmuir cells*

John Lumley and Sidney Leibovich, Cornell University, USA

10.30 : *Near surface dissipation rates : are recent measurements and models consistent*

E.A. Terray, Woods Hole Oceanographic Institution, USA and W.M. Drennan, National Water Research Institute, Canada

11.00 : *Turbulence in the upper two meters of a wind driven sea*

Johannes Gemmrich, David M. Farmer, Institute of Ocean Sciences, Sidney, Canada

11.30 : *Tracer studies of mixing in the ocean*

James R. Ledwell, Woods Hole Oceanographic Institution, USA, Andrew J. Watson, University of East Anglia, UK

12.00 : *Basin scale double-diffusive layering in the Arctic Ocean*

Robin D. Muench, Earth and Space Research, Seattle, USA, Bert Rudels, University of Hamburg, Germany, Göran Björk, University of Göteborg, Sweden, Ursula Schauer, Alfred-Wegener-Institut, Bremerhaven, Germany

14.00 - 16.00 Session 2

Chairperson : J. PINKEL

14.00 : *Secondary circulations and mixing in Juan de Fuca Strait : expectations and observations*

Richard Dewey, Michael Ott and Chris Garrett, University of Victoria, Canada

14.30 : *Bottom boundary layer turbulence measurements using particle image velocimetry*

Luca Bertuccioli, Gary Roth, Joseph Katz, Thomas Osborn, The Johns Hopkins University, USA

15.00 : *Rotationally dominated convective turbulence and its relevance to convection in oceans*

H.J.S. Fernando, Arizona State University, Tempe, USA

15.30 : *Models of turbulence in the marine environment - A comparative study of two-equation turbulence models*

Hans Burchard, Joint Research Centre Ispra, Italy, Ole Petersen, Danish Hydraulics Institute, Horsholm, Denmark

(Coffee Break and Poster Display : 16.00 - 16.30)

16.30 - 18.30 Session 3

Chairperson : J. WOODS

16.30 : *Coupling turbulence and plankton*

H. Yamazaki, Tokyo University of Fisheries, Japan

17.00 : *On the role of oceanic convection in primary production*

Jan O. Backhaus, Henning Wehde, Jochen Kämpf, Universität Hamburg, Germany

17.30 : *How viscoelastic properties of biopolymers modify turbulent structures, mixing, and exchange with pelagic particles*

Ian R. Jenkinson, Association Canillacoise pour la promotion de la Recherche Océanographique, France

18.00 : *Turbulence, marine snow formation and planktivorous feeding*

Thomas Kiorboe, Danish Institute for Fisheries Research, Charlottenlund, Denmark

18.30 Reception by the Chairman of the Scientific Organizing Committee

TUESDAY, May 6th, a.m. 9.00 - 12.30

Chairperson and animators : S. THORPE

E. TERRAY

I. LOZOVATSKY

(Coffee Break and Poster Display : 10.30 - 11.00)

Near-surface dissipation and small-scale turbulence

Energy dissipation, momentum flux and mixing due to breaking wave crests

Alastair D. Jenkins, Nansen Environmental and Remote Sensing Center, Norway

Small-scale structure of near-surface layer of the ocean in the western Pacific warm pool

Alexander Soloviev, Nova Southeastern University's Oceanographic Center, USA, Roger Lukas, University of Hawaii, Honolulu, Hawaii

Upper ocean layer shear, internal waves and vertical mixing in the Eurasian Basin of the Arctic Ocean

Robin Muench, Earth and Space Research, Seattle, USA, Richard Dewey, University of Victoria, Canada and John Gunn, Earth and Space Research, Seattle, USA

Turbulence mediated heat transfer at a free surface

R.A. Handler, J.R. Saylor, A.L. Rovelstad and R.I. Leighton, Naval Research Laboratory, Washington, USA
A 1-D

" Once-through " air-water fluid dynamic and transport model and its application for simulating the atmosphere-sea near interface dynamics

Walter Eifler and Adolf Stips, Joint Research Center, Ispra, Italy

Motions induced by wave breaking near the air-sea interface

G. Chen, C. Kharif, Institut de Recherche sur les Phénomènes Hors Equilibre, Marseille, France, J. Li and S. Zaleski, Université Pierre et Marie Curie, Paris, France

Scales of turbulence and parameterization of mixing in the ocean boundary layer

Miles G. McPhee, McPhee Research Company, Naches, USA

Investigation of near surface fluxes and turbulent dissipation in two Alpine lakes

Adolf Stips, Joint Research Center Ispra, Italy, Bjarke Ramussen, National Environmental Research Institute, Denmark, Andre Simon, Swiss Federal Institute for Environmental Science and Technology, Dübendorf, Switzerland

Transfer of wind energy to waves, currents and turbulence in the surface boundary layer of lakes

A. Simon*, O. Kocsis, M. Schurter and A. Wüest, Swiss Federal Institute for Environmental Science and Technology and Swiss Federal Institute of Technology, Dübendorf; Switzerland

Turbulent kinetic energy dissipation in the surface boundary layer of a lake during convection

A. Wüest*, A. Simon, O. Kocsis, M. Schurter, Swiss Federal Institute for Environmental Sciences and Technology and Swiss Federal Institute of Technology, Dübendorf, Switzerland, J. Sander, University of Bern, Switzerland

(* one single presentation)

TUESDAY, May 6th, p.m. 14.00 - 15.30

Chairperson and animators : J. GEMMRICH

O. KOCSIS

E. STANEV

(Coffee Break and Poster Display : 15.30 - 16.00)

Langmuir circulation and large scale turbulence

Interaction of oceanic convection and Langmuir circulation (nonhydrostatic numerical process studies)

Jochen Kämpf and Jan O. Backhaus, Universität Hamburg, Germany

Vertical structure of the oceanic surface boundary layer

Albert J. Plueddemann and Robert A. Weller, Woods Hole Oceanographic Institution, USA

Effects of waves and large eddies on mixed layer structure : theory and numerical modelling

Anand Gnanadesikan, Princeton University, USA

The influence of wave breaking and Langmuir circulations on the upper mixed layer

W. Kendall Melville, Scripps Institution of Oceanography, USA

16.00 - 17.30 Session 4

Chairperson : W. MEECHAM

16.00 : *Experiments and direct numerical simulations on turbulent mixing in a stably stratified ocean*

C.W. Van Atta, Scripps Institution of Oceanography, USA

16.30 : *Internal waves, vortices and turbulence in a stratified wake*

Yuli D. Chashechkin, Institute for Problems in Mechanics RAS, Moscow, Russia

17.00 : *Fossil turbulence revisited*

Carl H. Gibson, University of California San Diego, USA

WEDNESDAY, May 7th, a.m. 9.00 - 12.30

Chairperson and animators : C. GIBSON

J. LEDWELL

R. DEWEY

R. MUENCH

(Coffee Break and Poster Display : 10.30 - 11.00)

Processes of mid and deep water mixing

Shear, strain and mixing in the ocean thermocline

Robert Pinkel and Matthew Alford, Marine Physical Laboratory, Scripps Institution of Oceanography, La Jolla, USA, Steven Anderson, Woods Hole Oceanographic Institution, USA

Spatial variability of turbulent mixing in the abyssal ocean

J.M. Toole, K.L. Polzin, J.R. Ledwell and R.W. Schmitt, Woods Hole Oceanographic Institution, USA

Vertical diffusivities in the three basins of Lake Baikal inferred from microstructure profiles

O. Kocsis, M. Schurter and A. Wüest, Environmental Physics, Swiss Federal Institute for Environmental Science and Technology, Dübendorf, Switzerland

Turbulent kinetic energy dissipation rate estimates from temperature and velocity. Microstructure measurements : a comparison

Harmut Prandke, ME Meerestechnik-Elektronik GmbH, Germany, Otti Kocsis, Swiss Federal Institute for Environmental Science and Technology, Switzerland; Adolf Stips, Joint Research Center Ispra, Italy

The contribution of salt fingers to vertical mixing in the North Atlantic tracer release experiment

L. St. Laurent and R.W. Schmitt, Woods Hole Oceanographic Institution, USA

What drives thermohaline intrusions in the Baltic Sea ?

V.M. Zhurbas and V.T. Paka, Shirshov Institute of Oceanology, Moscow/Kaliningrad, Russia

Discriminating between the spectral signatures of salt fingers and turbulence

R.W. Schmitt and L. St. Laurent, Woods Hole Oceanographic Institution, USA

Oceanic turbulence peculiarities

Rostislav Ozmidov, P.P. Shirshov Institute of Oceanology, Moscow, Russia

Ocean turbulent mixing : universality and complexity

Iossif D. Lozovatsky, P.P. Shirshov Institute of Oceanology, Moscow, Russia

Can turbulent microstructure tell us about thermohaline interleaving ?

Barry Ruddick, Dalhousie University, Halifax, Canada and Neil Oakey, Bedford Institute of Oceanography, Canada

Interleaving at the Azores front/current as a tracer of turbulent mixing

N.P. Kuzmina, P.P. Shirshov Institute of Oceanology, Moscow, Russia

WEDNESDAY, May 7th, p.m. 14.00 - 17.30

Chairperson and animators : A. STIGEBRANDT

J. SHARPLES

Y. LEREDDE

A. DAVIES

(Coffee Break and Poster Display : 15.30 - 16.00)

Turbulence in estuaries, coastal waters and shelf seas

Flow and turbulent structure in a coastal tidal channel

Rolf Lueck and Youyu Lu, University of Victoria, Canada

Observations of stratified turbulence in an estuary

Hartmut Peters, University of Miami, USA

Vorticity and turbulence in a shallow tidal channel

Thomas B. Sanford and Ren-Chieh Lien, University of Washington, Seattle, USA

Near-bottom shear, stratification and stress in an estuarine tidal flow

J.H. Trowbridge and A.J. Williams, Woods Hole Oceanographic Institution, USA

Reynolds stress measurements in a partially stratified estuary

Mark Stacey, Stephen Monismith, and Jon Bureau Stanford University, USA

Turbulent dissipation in regions of thermal stratification on the North West European shelf

T.P. Rippeth, M.E. Inall, J.H. Simpson, University of Wales Bangor, UK and J.V.S. Cheok, Marine Department, Ministry of Communications, Brunei Darussalam

Near-surface acoustic signature of mixing processes in shallow tidal well-mixed sea

A. Graham, Southampton Oceanography Centre, UK

Waves and turbulent bores in two-layer flow

V. Yu. Liapidevskii, Lavrentyev Institute of Hydrodynamics, Novosibirsk, Russia

Lagrangian measurements of horizontal turbulence characteristics in the surface mixed layer of Lake Ontario

B.K. Pal, R.E. Thomson, Institute of Ocean Sciences, Canada, C.R. Murthy, National Water Research Institute, Canada

Turbulent dissipation within a non-linear internal tide

M.E. Inall, T.J. Sherwin, T.P. Rippeth, University of Wales Bangor, UK

Eddy structure of horizontal water movement in shallow seas with special reference to the North Sea

G.C. Van Dam, Aqua Systems International, The Netherlands, Rostislav V. Ozmidov and Konstantin A. Korotenko, P.P. Shirshov Institute of Oceanology, Moscow, Russia

THURSDAY, May 8th, a.m. 9.00 - 10.30

Chairperson and animators : H. FERNANDO

Th. OSBORN

E. KONTAR

(Coffee Break - Poster Display : 10.30 - 11.00)

Waves and turbulence

Reflection of near-inertial waves by vertical shear

Eric Kunze, University of Washington, Seattle, USA

Quasiinertial turbulence in the ocean

V.V. Navrotsky, Pacific Oceanological Institute, Russia

Mixing caused by internal waves and turbulence : comparative analysis

V.V. Navrotsky, Pacific Oceanological Institute, Russia

Direct numerical simulation of the nonlinear energy transfers within an internal wave spectrum in the ocean

Toshiyuki Hibiya and Yoshihiro Niwa, University of Tokyo, Japan

Turbulence in natural water : a comparison of large eddy simulations with limnological observations

J. Sander, University of Bern, Switzerland, A. Simon, A. Wüest, Swiss Federal Institute for Environmental Sciences and Technology, Dübendorf, Switzerland

THURSDAY, May 8th, a.m. 11.00 - 12.30

Bottom boundary layer turbulence

Turbulent diffusion in the near-bottom boundary layer of the Black Sea shelf zone

V. Kushnir, Marine Hydrophysical Institute, Sevastopol, Ukraine

The bottom boundary layer on the Southern Flank of Georges Bank

Sandra R. Werner and Robert C. Beardsley, Woods Hole Oceanographic Institution, USA

Benthic storms on the sea-floor

Evgeny A. Kontar and Alexei V. Sokov, P.P. Shirshov Institute of Oceanology, Moscow, Russia

Three-dimensional mixing mechanisms of expanding gravity currents and internal bores

Hary Yeh, University of Washington, USA and Kiyoshi Wada, Gifu National College of Technology, Japan

The influence of turbulence on sedimentation in the Black Sea

T.P. Lebedeva, F.B. Perepada, Marine Hydrophysical Institute, Sevastopol, Ukraine

Waves and turbulent bores in two-layer flow

V. Yu. Liapidevskii, Lavrentyev Institute of Hydrodynamics, Novosibirsk, Russia

THURSDAY, May 8th, p.m. 14.00 - 18.30

Chairpersons and animators : H. YAMAZAKI

J. BACKHAUS

I. JENKINSON

Th. KIORBOE

(Coffee Break - Poster Display : 16.00 - 16.30)

Turbulence and biology

Observations of mixed layer in coastal waters

F. Nilsen, M. Mork, University of Bergen, Norway

The effect of wind events and turbulent mixing on the nutrient-phytoplankton dynamics during a drift study in the northern North Sea

Andre W. Visser, Brian R. MacKenzie, Danish Institute for Fisheries Research, Denmark, and William R. Crawford, Institute of Ocean Sciences, Sidney, Canada

Modelling plankton behaviour in turbulent conditions : reconciling laboratory studies with environmental models

Andre W. Visser and Thomas Kiorboe, Danish Institute for Fisheries Research, Denmark

Vertical mixing influence on the compensation depth

Wojciech Szeligiewicz, Institute of Ecology PAS, Poland

Spring-neaps modulated turbulence as a mechanism for enhanced primary production at tidal mixing fronts

Jonathan Sharples, Southampton Oceanography Centre, UK

On the plankton front waves accelerated by marine turbulence

S.V. Petrosvskii, P.P. Shirshov Institute of Oceanology, Moscow, Russia

The role of turbulence influencing phytoplankton dynamics in a macro tidal estuary

Mary Lou Lauria, Duncan Purdie and Jonathan Sharples, University of Southampton, UK

Mixing and Cyanobacteria blooms in a lake

M. Kumagai, J. Chunmeng, T. Nakajima, Lake Biwa Research Institute, Japan, J.J. Frenettee, Kyoto University, Japan, and S. Nakano, Ehime University, Japan

Influence of fine-scale stratification of the sea onto 2D function describing distribution of chlorophyll-a concentration

L. Dzierzbicka-Glowacka and A. Zielinski, Institute of Oceanology PAS, Poland

Field studies of turbulence and feeding in larval fish : new directions for addressing current concerns

John F. Dower, Queen's University, Canada, Thomas J. Miller, Chesapeake Biological Lab., USA, Pierre Pepin, Department of Fisheries and Oceans, St. John's, Nfld, Canada, and William C. Leggett, Queen's University, Canada

Turbulence frontal zones of the equatorial Atlantic. The influence on the macroplankton community

Sergey M. Ignatyev, Institute of Biology of the Southern Seas (IBSS), Sevastopol, Ukraine

Heterogeneity of the euphotic layer in tropical and south Atlantic

N. Shalovenkov, Institute of Biology of Southern Seas, Sevastopol, Ukraine

Turbulent field measurements from an underwater tower in shallow water

J.E. Stiansen, S. Sundby, T. Gytre, Institute of Marine Research, Nordnes, Norway and J.E.O. Nilsen, University of Bergen, Norway

FRIDAY, May 9th, a.m. 9.00 - 12.30

Chairperson and animators : C. VAN ATTA

H. BURCHARD

M. McPHEE

V. KUSHNIR

(Coffee Break and Poster Display : 10.30 - 11.00)

Turbulent closure

Why algebraic energy spectra ? Rather than some one of millions of other functions ; relation to general nonlinear random problems

William C. Meecham, University of California, Los Angeles, USA

Determination of the time of predictability for nonlinear stochastic dynamics by determinate models

L.M. Ivanov and T.M. Margolina, Marine Hydrophysical Institute, Sevastopol, Ukraine

3D coastal circulation modelling with a k- closure model corrected to account for non-isotropic effects

C. Verdier-Bonnet, Station Zoologique, France, Ph. Angot, Institut de Recherche sur les Phénomènes Hors Equilibre, Marseille, France, Ph. Fraunie, Université de Toulon et du Var, France, M. Coantic, Institut de Recherche sur les Phénomènes Hors Equilibres, Marseille, France

Is knowledge of diapycnal mixing in fjords basins of general interest ?

Anders Stigebrandt, University of Göteborg, Sweden

Turbulent closure models in marine environment system analysis

I.E. Timchenko, Marine Hydrophysical Institute, Sevastopol, Ukraine

Similarity theory for the upper ocean

D. Chalikov, UCAR/NCEP, Environmental Modelling Center, Camp Spring, USA

On k- and k- models for shallow seas. Review and outlook

H. Baumert, Universität Hamburg, Germany and H. Burchard, Joint Research Center, Ispra, Italy, E. Kleine, Bundesamt für Seeschifffahrt und Hydrographie, Hamburg, Germany

Homogeneous k-equation model and its application in the coastal sea

H. Wei, S. Feng, Ocean University of Qingdao, Institute of Physical Oceanography, Qingdao, P.R. China

FRIDAY, May 9th, p.m. 14.00 - 17.30

Chairperson and animators : Ph. FRAUNIE

A. GNANADESIKAN

J.M. BECKERS

(Coffee Break - Poster Display : 15.30 - 16.00)

Ocean turbulence models and applications

Turbulent behavior of a high resolution North Atlantic model simulation

E.P. Chassignet, A. Paiva, J. Hargrove and R. Bleck, University of Miami, USA

Determining tidally induced turbulence in shallow sea and shelf edge regions

Alan M. Davies and Jiuxing Xing, Bidston Observatory, UK

Facets of the GHER 3D turbulent closure model. Applications to the Adriatic Sea, the Bering Sea, the North Sea, the Mediterranean Sea and the Black Sea

J.M. Beckers, E. Delhez, S. Djenidi, M. Grégoire, G. Martin and J.C.J. Nihoul, GHER, University of Liège, Belgium

Sensitivity of vertical temperature velocity and viscosity profiles with respect to different model realisations

Thomas Pohlmann, Universität Hamburg, Germany

Sensitivity of a world ocean model including sea-ice and CFC transport to the parameterization of the vertical mixing

H. Goosse, E. Deleersnijder, Université Catholique de Louvain, Belgium, M. England, The University of South Wales, Australia, T. Fichefet and J.M. Campin, Université Catholique de Louvain, Belgium

Data assimilation in turbulent ocean models

E.M. Igumnova, I.E. Timchenko, Marine Hydrophysical Institute, Sevastopol, Ukrainia

Marine turbulence optimized by data assimilation

Y. Leredde, Centre d'Océanologie de Marseille, France, J.L. Devenon, Université de Toulon et du Var, France, I. Dekeyser, Centre d'Océanologie de Marseille, France

A comparative study of turbulence closure schemes for tidal flows with application to the Irish Sea

Patrick J. Luyten, Management Unit of the Mathematical Model of the North Sea and Scheldt Estuary, Belgium and Tom P. Rippeth, University of Wales Bangor, UK

Secondary turbulence as production of non-linear interaction between a turbulent wake and a stratified shear flow

Konstantin A. Korotenko, P.P. Shirshov Institute of Oceanology, Russia

Turbulence in natural water : a comparison of large eddy simulations with limnological observations

J. Sander, University of Bern, Switzerland, A. Simon, A. Wüest, Swiss Federal Institute for Environmental Sciences and Technology, Dübendorf, Switzerland

Transition to turbulent behaviour of Lagrangian floats through capture and release by mesoscale eddies

G.I. Shapiro, P.P. Shirshov Institute of Oceanology, Russia, E.D. Barton, University of Wales Bangor, UK, S.L. Meschanov, P.P. Shirshov Institute of Oceanology, Russia