4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

"Building Better Products with CFD"

in conjunction with
ASME/JSME/KSME
Pressure Vessels and Piping Conference
August 4- 8, 2002, Vancouver, British Columbia, Canada

SPECIAL EVENTS:

Tutorials - Sunday, August 04, 2002
8.30 - 11.30am and 12.00pm - 3.00pm

Modeling Turbulent Flow in Complex Vanes, Pipes, Plenums using Commercial CFD Software

Hands-on training class with the computer. To register please visit http://www.software.aeat.com/cfx/seminars/register.asp?id=53

(id=52 for 8.30 –11.30 and id=53 for 12.-3 om)

PANEL DISCUSSION ON PRESENT AND FUTURE INDUSTRIAL STRENGTH CFD CODES – Aug 6th, 2002

4.30- 8 pm **(see page 8 for details)**

Panel presenters:

Dr. Ashok Singhal, President and Technical Director, CFD Research (Huntsville, AL, USA)
Dr. Dipankar Choudhury, Chief Technology Officer, Fluent (Lebanon,USA)
Prof. Fred Habashi, President, Newmerical Technologies & Editor-in-Chief Journal of Computational Fluid Dynamics (Montreal, QB, CANADA)
Dr. Michael Raw, VP of CFX Development, AEA Technology (Oxfordshire, UNITED KINGDOM)
Prof. Brian Spalding, CHAM Ltd. (London, UNITED KINGDOM)
Dr. Philip Stephenson, Director, CD ADAPCO Group (Plymouth, MI, USA)
Dr. Torsten Wintergerste, ERCOFTAC and Sultzer Innotec (Wintherthur, SWITZERLAND)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

Technical Sessions

SESSION 1.1O (FSI-11A)

Date: August 5, 2002 Time: 8:30AM – 10:15AM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
I: FUNDAMENTALS, CODES AND POST-PROCESSING (1)

Sponsored by: Fluid-Structure Interaction Committee

Published in PVP Vol. zzz-1 and zzz-2, Computational Technologies for Fluid/Thermal/Chemical Systems with Industrial Applications - 2002

Developed by: V.V. Kudriavtsev, CFD Canada (Toronto, ON, CANADA)
S. Kawano, Tohoku University (Sendai, JAPAN)
C.R. Kleijn, Delft University of Technology (Delft, THE NETHERLANDS)

Chairman: V.V. Kudriavtsev, CFD Canada (Toronto, ON, CANADA)
Vice Chairman: S. Kawano, Tohoku University (Sendai, JAPAN)

A TECHNIQUE FOR SPECIFYING REGION OF INTEREST IN THE VECTOR FIELD BASED ON 3D LIC
Koji Sakai, Koji Koyamada, Kazuma Kamisawa, Akio Doi, Research Institute For Environmental Sciences and Public Health of Iwate Prefecture (Iwate, JAPAN), Kyoto University (Kyoto, JAPAN), Iwate Prefectural University (Iwate, JAPAN)

CFD-CODE EVALUATION FOR COMPLEX INTERIOR FLOWS
H. Herwig, TU Hamburg-Harburg (Hamburg, GERMANY), H. Mocikat, T. Guertler, TU Chemnitz (Chemnitz, GERMANY)

A TECHNIQUE FOR SKELETONIZING A SCALAR FIELD USING A CRITICAL POINT GRAPH: APPLICATION TO A WEATHER SIMULATION
Kazuma Kamisawa, Koji Sakai, Koji Koyamada, Akio Doi, Iwate Prefectural University (Iwate, JAPAN), Research Institute for Environmental Sciences and Public Health of Iwate Prefecture (Iwate, JAPAN), Kyoto University (Kyoto, JAPAN)

THE BEST PRACTICE GUIDELINE FOR CFD - AN EUROPEAN INITIATIVE ON QUALITY AND TRUST (KEYNOTE)
Torsten Wintergerste, ERCOFTAC and Sulzer Innotec (Wintherthur, SWITZERLAND)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 1.3O (FSI-11B)

Date: August 5, 2002 Time: 2:00PM – 3:45PM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
II: FUNDAMENTALS, CODES AND POST-PROCESSING (2)

Sponsored by: Fluid-Structure Interaction Committee

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V.V. Kudriavtsev, CFD Canada (Toronto, ON, CANADA)

Chairman: Maurizio Masi, Politecnico di Milano (Milano, ITALY)
Vice Chairman: Toshiharu Muramatsu, Japan Nuclear Cycle Development Institute (Ibaraki, JAPAN)

ADVANCED CFD TECHNOLOGY DEVELOPMENT (KEYNOTE)
Dipankar Choudhury, FLUENT (Lebanon, NH, USA)

CONVERGENCE ACCELERATION OF K-ω TURBULENCE EQUATIONS WITH MULTIGRID
Soo Hyung Park, Chun-Ho Sung, Jang Hyuk Kwon, Korea Advanced Institute of Science and Technology (Rok, KOREA)

FLOW VISUALIZATION OF THE EVOLUTION of TAYLOR INSTABILITIES AND COMPARISON WITH NUMERICAL SIMULATIONS
M.J. Braun, University of Akron (Akron, OH, USA), V. Kudriavtsev, CFD Canada (Toronto, CANADA), Rajka Krstic Corder, Spectral Instruments (Tucson, AZ, USA)

SIMULATION of ARTIFICIAL TURBULENCE BY THE VORTEX METHOD
Yoshifumi Ogami, Kazuie Nishiwaki, Yoshinobu Yoshihara, Ritsumeikan University (Shiga, JAPAN)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 1.4O (FSI-11C)

Date: August 5, 2002 Time: 4:00 PM – 5:45PM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
III: FLOW IN INTERACTION WITH ELECTROMAGNETIC FIELDS

Sponsored by: Fluid-Structure Interaction Committee

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S. Kawano, Tohoku University (Sendai, JAPAN)

Chairman: Ashok Singhal, CFDRC (Huntsville, AL, USA)
Vice Chairman: Kenichi Takita, Tohoku University (Sendai, JAPAN)

COMPUTATIONAL ELECTROMAGNETIC NONDESTRUCTIVE EVALUATION AND INVERSE ANALYSIS IN DEFECTS CHARACTERIZATION (KEYNOTE)
Toshiyuki Takagi, Tohoku University (Sendai, JAPAN)

A THREE DIMENSIONAL SIMULATION MODEL FOR LIQUID PHASE ELECTROEPITAXY UNDER MAGNETIC FIELD
Y.C. Liu, H. Sheibani, S. Sakai, S. Dost, University of Victoria (Victoria, CANADA),
Y. Okano Shizuoka University, Hamamatsu, Japan

THREE- DIMENSIONAL NUMERICAL ANALYSES ON LIQUID-METAL MAGNETOHYDRODYNAMIC FLOW IN MAGNETIC-FIELD INLET-REGION
Hiroshige Kumamaru, Himeji Institute of Technology (Hyogo, JAPAN)

NUMERICAL ANALYSIS OF AIR CONVECTION IN A VERTICAL CYLINDRICAL CONTAINER WITH AND WITHOUT A GRAVITATIONAL FIELD UNDER A GRADIENT OF A MAGNETIC FIELD
Masato Akamatsu, Mitsuo Higano, Yoshio Takahashi, Hiroyuki Ozoe, Akita Prefectural University (Akita, JAPAN), Kyushu University (Fukuoka, JAPAN)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 2.1O (FSI-11D)

Date: August 6, 2002 Time: 8:30AM – 10:15AM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
IV: REACTING AND COMBUSTING FLOWS (1)

Sponsored by: Fluid-Structure Interaction Committee

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S. Kawano, Tohoku University (Sendai, JAPAN)
C.R. Kleijn, Delft University of Technology (Delft, THE NETHERLANDS)

Chairman: Jiin-Yuh Jang, National Cheng-Kung University (Tainan, TAIWAN) Vice-chairman: Vladimir Kudriavtsev, CFDC (Toronto, ON, CANADA)

MULTI-SCALE AND MULTI-HIERARCHY MODELLING IN ELECTRONIC MATERIALS PROCESSING (KEYNOTE)

Maurizio Masi, Carlo Cavalotti, Gianluca Valente, Marco di Stanislao, Politecnico di Milano (Milano, ITALY)

SIMULATION of SIO2 DEPOSITION IN A VERTICAL 300 MM LPCVD FURNACE

G.J. Schoof, C.R. Kleijn, H.E.A. Van den Akker, T.G.M. Oosterlaken, H.J.C.M. Terhorst and F. Huussen
Delft University of Technology (Delft, THE NETHERLANDS) and ASM International (Bilthoven, THE NETHERLANDS)

A NEWTON-KRYLOV BASED SOLVER FOR MODELING FINITE RATE CHEMISTRY

D. Wang, M. Bockelie, M. Cremer and J.Y. Chen, Reaction Engineering (Salt Lake City, UT, USA) and UC at Berkeley (Berkeley, CA, USA)

NUMERICAL MODELING OF COMBUSTION PROCESSES AND POLLUTANTS FORMATION IN DIRECT INJECTION DIESEL ENGINE

Hoo-Joong Kim, Sung-Mo Kim, Sung-Ku, Yong-Mo Kim, Jae-Hyun Ahn, Hanyang University (Seoul, KOREA), Cleancom Inc. (Seoul, KOREA)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 2.2O (FSI-11E)

Date: August 6, 2002 Time: 10:30AM – 12:15PM Room: Regency A
Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
V: REACTING AND COMBUSTING FLOWS (2)

Sponsored by: Fluid-Structure Interaction Committee

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V.V. Kudriavtsev, CFD Canada (Toronto, ON, CANADA)

Chairman: H. Herwig, TU Hamburg-Harburg (Hamburg, GERMANY)
Vice Chairman: Kohji Koyamada, Kyoto University (Kyoto, JAPAN)

MULTISCALE ANALYSIS OF NONEQUILIBRIUM RAREFIED GAS FLOWS (KEYNOTE)
Yoichiro Matsumoto, The University of Tokyo (Tokyo, JAPAN)

DENSITY DISTRIBUTION IN STAGNATION REGION OF SAFFMAN EQUATION FOR DUSTY GAS
Kazuhiro Tsuboi, Ibaraki University (Ibaraki, JAPAN)

SIMULATION OF INVISCID MULTI-SPECIES PLASMA FLOW
A. Martin, M. Reggio, J.Y. Trepanier, CERCA, Montreal (Montreal, CANADA) and Ecole Polytechnique (Montreal, CANADA)

NUMERICAL SIMULATION of FULL OXY-FIRED OSCILLATING COMBUSTION
Ovidiu Marin, Benjamin Bugeat, Air Liquide (Countryside, IL, USA)
Olivier Louedin, Marc Till, Air Liquide (Les Loges en Josas, France)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 2.3O (FSI-11F)

Date: August 6, 2002 Time: 2:00PM – 3:45PM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
VI: FLOW IN TURBOMACHINERY AND ENGINES

Sponsored by: Fluid-Structure Interaction Committee

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S. Kawano, Tohoku University (Sendai, JAPAN)

Chairman: M. Jack Braun, University of Akron, (Akron, OH, USA)
Vice Chairman: Yongmo Kim, Hanyang University (Seoul, KOREA)

NUMERICAL STUDY ON THE UNSTEADY BEHAVIOR IN TURBOMACHINERY (KEYNOTE)
Je-Hyun Baek, Postech (Kyungbuk, KOREA)

VALIDATED 1D/3D COUPLING METHOD TO SOLVE TRANSIENT FLOW IN INTERNAL COMBUSTION ENGINES
R. Sinclair, P. Schindler, T.S Strauss, Volkswagen AG (Wolfsburg, GERMANY)

LARGE EDDY SIMULATION of TURBULENT COMBUSTION FLOWS IN GAS TURBINE COMBUSTOR
Takuji Tominaga, Nobuyuki Taniguchi, Yuichi Itoh, Toshio Kobayashi, The University of Tokyo (Tokyo, JAPAN)

USING CFD TO IMPROVE AERO-ENGINE AIR/OIL SEPARATOR DESIGN
C. Eastwick, S. Hibberd, K. Simmons, Y. Wang, A. Aroussi, University of Nottingham (Nottingham, UNITED KINGDOM), I. Care, Rolls-Royce plc. (Derby, UNITED KINGDOM)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 2.4O (FSI-11G)

Date: August 6, 2002 Time: 4:00PM – 5:45PM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS: VII: PANEL DISCUSSION ON PRESENT AND FUTURE of INDUSTRIAL STRENGTH CFD CODES

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C.R. Kleijn, Delft University of Technology (Delft, THE NETHERLANDS)
S. Kawano, Tohoku University (Sendai, JAPAN)

Chairman: Prof. Brian Spalding, CHAM Ltd. (London, UNITED KINGDOM)

Panel presenters:

- Dr. Dipankar Choudhury, Chief Technology Officer, Fluent (Lebanon, NH, USA)
- Prof. Fred Habashi, President, Newmerical Technologies & Editor-in-Chief Journal of Computational Fluid Dynamics (Montreal, QB, CANADA)
- Dr. Michael Raw, VP of CFX Development, AEA Technology (Oxfordshire, UNITED KINGDOM)
- Dr. Ashok Singhal, President and Technical Director, CFD Research (Huntsville, AL, USA)
- Prof. Brian Spalding, CHAM Ltd. (London, UNITED KINGDOM)
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4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 3.1O (FSI-11H)

Date: August 7, 2002 Time: 8:30AM - 10:15AM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
VIII: REACTING AND COMBUSTING FLOWS (3)

Sponsored by: Fluid-Structure Interaction Committee

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Chairman: Haruo Terasaka, Tohoku University (Sendai, JAPAN)
Vice Chairman: Per Nielsen, Haldoer Topsoe A/S (Lyngby, DENMARK)

HYDROGEN DISTRIBUTION, COMBUSTION AND DETONATION FOR H2 RISK ANALYIS IN LARGE FACILITIES
A. Beccantini, N. Coulon, F. Dabbene, S. Gounand, S. Kudriakov, J.-P. Magnaud, H. Paillere, Cea (Gif-sur-Yvette, FRANCE)

NUMERICAL ANALYSIS of INTERACTION BETWEEN PLASMA JET AND FLAME IN SUPERSONIC FLOW
Kenichi Takita, Tohoku University (Sendai, JAPAN)

NUMERICAL SIMULATION of NON-PREMIXED DIFFUSION FLAME AND REACTION PRODUCT AEROSOL BEHAVIOR IN LIQUID METAL POOL COMBUSTION
Akira Yamaguchi and Yuji Tajima, Japan Nuclear Cycle Development Institute (Ibaraki, JAPAN)

NUMERICAL MODELING of ECCENTRIC JET PRECOMBUSTOR
Sun Yezhu, Huaneng Power Intl. Inc (Beijing, P.R. CHINA)

USING COMPUTATIONAL TECHNOLOGY TO SIMULATE LARGE MIXING-LIMITED FIRES USING THREE-DIMENSIONAL CALCULATIONS
Rodman R. Linn, Los Alamos National Laboratory (Los Alamos, NM, USA)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 3.1 N (FSI-11I)

Date: August 7, 2002 Time: 8:30AM – 10:15AM Room: Regency B

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
IX: FLOW IN BIOLOGICAL AND MEDICAL SYSTEMS

Sponsored by: Fluid-Structure Interaction Committee

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Chairman: Ned Djilali, University of Victoria (Victoria, CANADA)
Vice Chairman: Kil -Mo Koo, Korea Atomic Energy Research Institute (Daejeon, KOREA)

DESIGN ANALYSIS OF THE VOLUMATIC SPACER - A CFD AND EXPERIMENTAL STUDY

V. Jalili, M.K. Patel, C. Bailey, University of Greenwich (Greenwich, UNITED KINGDOM), S.M. Begg, University of Brighton (Brighton, UNITED KINGDOM), H.K. Versteeg, I. Hargrave, University of Loughborough (Loughborough, UNITED KINGDOM), I. Shrubb, Astra Zeneca Pharmaceutical Company (Loughborough, UNITED KINGDOM)

THREE-DIMENSIONAL FLOW ANALYSIS IN VFP TYPE ARTIFICIAL HEART BY UNSTRUCTURED GRID

Satoyuki Kawano, Takuma Kato, Kazuhiro Nakahashi, Atsushi Shirai, Toshiyuki Hayase, Tomoyuki Yambe, Shin-Ichi Nitta, Hiroyuki Hashimoto, Tohoku University (JAPAN), Ebara Research Co. Ltd. (Fujisawa, JAPAN)

CFD ANALYSIS of THE BEHAVIOR of AIRBORNE ALLERGENS IN CARPETED AND UNCARPETED DWELLINGS

Bradley A. Cicciarelli, MIT (Cambridge, MA, USA) David L. Davidson, Edward H. Hart and P. Robert Peoples, Solutia Inc. (Cantonment, FL, USA)

FORCED FLOW HEAT AND MASS TRANSFER TO A CYLINDER SURROUNDED BY A POROUS MATERIAL WITH APPLICATION TO NBC PROTECTIVE CLOTHING

M.P. Sobera, C.R. Kleijn, H.E.A. Van Den Akker, P. Brasser, Delft University of Technology (Delft, THE NETHERLANDS), TNO Prins Maurits Laboratory (Rijswijk, THE NETHERLANDS)

SELF-EXCITATION VOCALIZATION ANALYSES of VOCAL CHORD UNDER BREATHING FLOW AND WIDE FREQUENCY CHANGE BY MUSCLE ACTIVATION

Toshio Tsuta, Takeshi Iwamoto, Toshiyuki Shimizu and Daisuke Egusa, Hiroshima University (Hiroshima, JAPAN)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 3.2O (FSI-11J)

Date: August 7, 2002 Time: 10:30AM – 12:15PM Room: Regency A
Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
X: FLOW IN ENERGY SYSTEMS (1)

Sponsored by: Fluid-Structure Interaction Committee

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Developed by: V.V. Kudriavtsev, CFD Canada (Toronto, ON, CANADA)
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Chairman: Yoichiro Matsumoto, The University Of Tokyo (Tokyo, JAPAN)
Vice Chairman: David L. Davidson, Solutia Inc. (Cantonment, FL, USA)

COMPUTATIONAL MODELLING AND SIMULATION of PROTON-EXCHANGE MEMBRANE FUEL CELLS (KEYNOTE)
Ned Djilali, University of Victoria (Victoria, BC, CANADA)

TOOLS AND TECHNIQUES FOR FUEL CELL PERFORMANCE SIMULATION
Alton J. Reich, Sandip Mazumder, J. Vernon Cole, CFD Research Corp. (Huntsville, AL, USA)

THREE DIMENSIONAL MODELING of THE MEDIUM SIZE FUEL CELL STACKS: THERMAL EFFECTS ON THE STACK PERFORMANCE
V. Kudriavtsev, CFD Canada (Toronto, CANADA), Rupak Das CFDRC (Huntsville, USA)

NUMERICAL EXPERIMENTS FOR FLOW AROUND DUCTED TIP HYDROFOIL
Hildur Ingvarsdottir, Carl Ollivier-Gooch, Sheldon Green, The University of British Columbia (Vancouver, BC, CANADA)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 3.3O (FSI-11K)

Date: August 7, 2002 Time: 2:45PM – 4:30PM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
XI: FLOW IN ENERGY SYSTEMS (2)

Sponsored by: Fluid-Structure Interaction Committee

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DEVELOPMENT OF ULTRASONIC TEMPERATURE SENSORS FOR ULTRA-HIGH TEMPERATURE MEASUREMENT IN NUCLEAR REACTOR VESSEL
Kil -Mo Koo, Kwang-Soon Ha, Rae-Joon Park, Sang-Baik Kim, Hee-Dong Kim, Hee-Young Kang, Korea Atomic Energy Research Institute (Daejeon, KOREA)

AUTOMATIC DESIGN OF HYDROPOWER FLOWS: THE DRAFT TUBE
T.S. Lundström, M. Lindgren, B.D. Marjavaara, Lulea University of Technology (Lulea, SWEDEN)

A NUMERICAL STUDY OF BWR STEAM SEPARATOR
Haruo Terasaka, Sensuke Shimizu, Tohoku University (Sendai, JAPAN)

CFD ANALYSIS OF TURBULENT FLOW IN A NUCLEAR FUEL BUNDLE WITH MIXING VANE
Wang Kee In, Dong Seok Oh, Tae Hyun Chun, Korea Atomic Energy Research Institute (Daejeon, KOREA)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 3.3O (FSI-11L)

Date: August 7, 2002 Time: 2:45PM – 4:30PM Room: Regency B

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
XII: FLOW IN MULTIPHASE SYSTEMS

Sponsored by: Fluid-Structure Interaction Committee

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S. Kawano, Tohoku University (Sendai, JAPAN)

Chairman: R.F. Mudde, Delft University of Technology (Delft, THE NETHERLANDS)
Vice Chairman: Z.L. Jiang, Chinese Academy of Sciences (Beijing, P.R. CHINA)

TRANSIENT 3D SIMULATION of THE TURBULENT GAS-SOLID FLOW IN LARGE SCALE RISERS USING A DENSITY BASED SOLUTION ALGORITHM
Asit K. Das, Gorik Van Engelandt, Guy B. Marin, Geraldine J. Heynderickx, University of Gent (Gent, BELGIUM)

NUMERICAL STUDY of THE TWO PHASE AIR/OIL FLOW WITHIN AN AERO-ENGINE BEARING CHAMBER MODEL USING A COUPLED LAGRANGIAN DROPLET TRACKING METHOD
K. Simmons, S. Hibberd, Y. Wang, I. Care, University of Nottingham (Nottingham, UNITED KINGDOM)

MULTIPHASE FLOW INVESTIGATION of A CENTRIFUGAL FILTER USING COMPUTATIONAL FLUID DYNAMICS AND EXPERIMENTS
S.D. Megson, M. Wilson, S.A. Macgregor, University of Bath (Bath, UNITED KINGDOM)

AN EXPERIMENTAL AND NUMERICAL INVESTIGATION INTO THE DISPERSION of POWDER FROM A PIPE
V.A.O. Anjorin, H. Tang, A.J. Morgan, I.E. Barton, Brunel University (Uxbridge, UNITED KINGDOM)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 3.4O (FSI-11M)

Date: August 7, 2002 Time: 4:45PM – 6:15PM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
XIII: FLOW AND MIXING

Sponsored by: Fluid-Structure Interaction Committee

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C.R. Kleijn, Delft University of Technology (Delft, THE NETHERLANDS)

Chairman: S. Kawano, Tohoku University (Sendai, JAPAN)
Vice Chairman: T.S. Lundström, Lulea University of Technology (Lulea, SWEDEN)

A COMPARISON OF SEVERAL CFD APPROACHES FOR PREDICTING GAS-LIQUID CONTACTING IN A CYLINDRICAL TANK AGITATED WITH A SINGLE RUSHTON TURBINE

Paul Gillis, Gerrit Hommersom and Matthias Schaefer, The Dow Chemical Company (Freeport, TX, USA), Dow Benelux (Terneusen, Netherlands) and BSL Olefinverbund Gmbh (Merseburg, Germany)

NUMERICAL INVESTIGATIONS OF A TURBULENCE MIXING PROCESS RELATED TO THERMAL STRIPING PHENOMENA AT A T-JUNCTION OF LIQUID METAL FAST REACTOR PIPING SYSTEMS

Toshiharu Muramatsu, Japan Nuclear Cycle Development Institute (Ibaraki, JAPAN)

CFD APPROACH OF GROWING CU-PARTICLES IN A 'KENICS' STATIC MIXER REACTOR

W.F.C. Van Wageningen, R.F. Mudde, H.E.A. Van Den Akker, Delft University of Technology (Delft, THE NETHERLANDS)

COMPUTATION OF FLUID-STRUCTURE INTERACTION IN A STATIC MIXER USING MPCCI

Torsten Wintergerste, Sulzer Innotec (Wintherthur, SWITZERLAND)

SIMULATION OF THE LAMINAR FLOW IN A PREMIX STATIC MIXER

R.F. Mudde, C. Van Pijpen, Delft University of Technology (Delft, THE NETHERLANDS), R. Beugels, Primix BV (Mijdrecht, THE NETHERLANDS)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 3.4O (FSI-11N)

Date: August 7, 2002 Time: 4:45PM – 6:15PM Room: Regency B

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
XIV: FLOW AND FLUID-STRUCTURE INTERACTION

Sponsored by: Fluid-Structure Interaction Committee

Published in PVP Vol. zzz-1 and zzz-2, Computational Technologies for Fluid/Thermal/Chemical Systems with Industrial Applications - 2002

Developed by: S. Kawano, Tohoku University (Sendai, JAPAN)
C.R. Kleijn, Delft University of Technology (Delft, THE NETHERLANDS)
V.V. Kudriavtsev, CFD Canada (Toronto, ON, CANADA)

Chairman: Toshiyuki Takagi, Tohoku University (Sendai, Miyagi, JAPAN)
Vice Chairman: S.A. Macgregor, University of Bath (Bath, UNITED KINGDOM)

LARGE EDDY SIMULATIONS OF FLOW INDUCED VIBRATIONS IN A VACUUM FLASHER UNIT
D. Tafti, Virginia Tech University (Blacksburg, VA, USA) and R.G. Menon, Shell Global Solutions (Houston, TX, USA)

INTERACTIVE SIMULATION OF GAS DECOMPRESSION AND CRACK PROPAGATION IN NATURAL GAS TRANSMISSION PIPELINES
Hiroyuki Makino, Yoshiaki Kawaguchi, Yoichiro Matsumoto, Shu Takagi, Shinobu Yoshimura, Sumitomo Metal Industries Limited (Hyogo, JAPAN), JSPS (Tokyo, JAPAN), The University of Tokyo (Tokyo, JAPAN)

MODELING OF STRUCTURAL VIBRATION FOR MOTOR CHAMBER INTERNAL FLOW
D.R. Greatrix, Ryerson University (Toronto, BC, CANADA), V.V. Kudriavtsev, CFD Canada (Toronto, BC, CANADA)

TUBULAR STRUCTURE DEFORMATION UNDER THE THERMAL LOADS OF TWO FLUIDS
Krishnamurthy Suresh, Samit Patil, Transoft International (Bangalore, INDIA), Amita Tripathi, Fluidyn FRANCE (Saint-Denis, FRANCE)

NUMERICAL ANALYSIS ON WAVE DYNAMIC PROCESSES IN PULSE DETONATION DEVICES
Z. L. Jiang, C. Wang, Z. M. Hu, W. Zhao, Chinese Academy of Sciences (Beijing, P.R. CHINA)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 4.1O (FSI-11O)

Date: August 8, 2002 Time: 8:30AM – 10:15PM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
XV: VARIOUS APPLICATIONS OF INDUSTRIAL CFD (1)

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CFD MODELING OF STEAM METHANE REFORMER
Vibhor Mehrotra, B. Rosendall, A. Heath, J. Berkoe, Bechtel (San Francisco, CA, USA)

EFFECTS ON PRANDTL NUMBER AND TRANSPIRATION PARAMETER ON A CERTAIN MHD FREE CONVECTION FLOW WITH VISCO-ELASTIC FLUID ALONG AN INFINITE VERTICAL POROUS PLATE
M. N. Islam, Tohoku University (Sendai, JAPAN)

NUMERICAL AND EXPERIMENTAL ANALYSIS OF AN EVAPORATION COOLER
Robert Kickinger, Peter Wimmer, Johannes Keppler University (Linz, AUSTRIA) Helmut Leibinger, Scheuch GmbH (Aurolzmuenster, AUSTRIA)

NUMERICAL ANALYSIS OF PHASE CHANGE AND NATURAL CONVECTION PHENOMENA DURING PIPE FREEZING PROCESS
Gi Ho Jeong, Byung Jin Ahn, Young Sik Seong, Kui Soon Kim, Busan National University (Pusan, KOREA)

THE DEVELOPMENT AND VALIDATION OF FAST NUMERICAL METHOD OF SIMULATING WET STEAM FLOW
Dongyang Zhang, Jianjun Liu, Hongde Jiang, Chinese Academy of Sciences (Beijing, P.R. CHINA)

REYNOLDS STRESS TURBULENCE MODEL FOR PREDICTION OF SHEAR STRESS TERMS IN FILM COOLING CROSS FLOW - NUMERICAL SIMULATION
A. Javadi, Kh. Javadi, Mohamad Taeibi-Rahni, Sharif University of Technology (Tehran, IRAN)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 4.2O (FSI-11P)

Date: August 8, 2002 Time: 10:30AM – 12:15PM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
XVI: VARIOUS INDUSTRIAL APPLICATIONS OF CFD (2)

Sponsored by: Fluid-Structure Interaction Committee

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MODELING THE AIRFLOW AROUND COOLING TOWERS WITH MULTI-BLOCK CFD
Zhiqiang Zhai, Song Fu, Massachusetts Institute of Technology (Cambridge, MA, USA) and Tsinghua University (Beijing, P.R. CHINA)

APPLYING CFD FOR DESIGN OF GAS CONDITIONING TOWERS WITH SWIRLING FLOW
Niels F. Nielsen and Leif Lind, FLS Miljo A/S (Copenhagen, DENMARK)

NUMERICAL CALCULATIONS OF WING TIP VORTICES AND EFFECTS OF SUCTION AT WING TIP
Satoshi Okada, Nobuyuki Arai, Katsumi Hiraoka, Tokai University (Hiratsuka, JAPAN)

INVESTIGATION OF TWO-EQUATION TURBULENCE MODELS APPLIED TO A CONFINED AXIS-SYMMETRIC SWIRLING FLOW
Ulf Engdar, Jens Klingmann, Lund Institute of Technology (Lund, SWEDEN)

NUMERICAL SIMULATION OF ASYMMETRIC EXHAUST FLOWS USING AN ACTUATOR DISC BLADE ROW MODEL
Jianjun Liu, Chinese Academy of Sciences (Beijing, P.R. CHINA)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 4.2O (FSI-11Q)

Date: August 8, 2002 Time: 10:30AM – 12:15PM Room: Regency B

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
XVII: CFD OF FLOW WITH HEAT TRANSFER

Sponsored by: Fluid-Structure Interaction Committee

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CFD SIMULATION OF THE SIDE WALL FIRED TUBULAR REFORMING FURNACE
Per Nielsen, Lars J. Christiansen, Haldoer Topsoe A/S (Lyngby, DENMARK)

AN ASSESSMENT OF PDP INSTALLED WITH VARIOUS RIBBED HEAT SPREADER FOR COOLING ENHANCEMENT
Jaejung Kim, Hongkoo Roh, Deoghee Doh, Seogweon Chang, Daewoo Elect. Co. Ltd. (Inchon, KOREA), Univ. of Maryland (Gaithersburg, MO, USA), Univ. of Korea Maritime (Pusan, KOREA)

THREE-DIMENSIONAL MODELING OF LIME KILNS
M. Georgallis, P. Nowak, M. Salcudean and I. S. Gartshore, University of British Columbia (Vancouver, BC, CANADA)

THREE-DIMENSIONAL THERMAL-HYDRAULIC ANALYSIS IN SLIT FINNED-TUBE HEAT EXCHANGERS
Jiin-Yuh Jang, Jer-Nan Yeh, Her-Chang Ay, Department of Mechanical Engineering National Cheng-Kung University (Tainan, TAIWAN)

FLOW SEPARATION AND HEAT TRANSFER IN SHEAR FLOW OVER A WALL-MOUNTED OBSTACLE
S. Mahapatra, S. Bhattacharyya, INDIAn Institute of Technology Kharagpur (Kharagpur, INDIA)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 4.3O (FSI-11R)

Date: August 8, 2002 Time: 2:00PM – 3:45PM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
XVIII: VARIOUS INDUSTRIAL APPLICATIONS OF CFD (3)

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A MODEL FOR SIMULATION HEAT TRANSFER IN POROUS MEDIA
Alton Reich, Mahesh Athavale, CFDRC (Huntsville, AL, USA)

TURBULENCE AND FIBER ORIENTATION IN THE CONVERGING SECTION OF A PAPER-MACHINE HEADBOX
Suqin Dong, Xiaosi Feng, Martha Salcudean, Ian Gartshore, and Mohammad Shariati, University of British Columbia (Vancouver, BC, CANADA)

USE OF CFD TO DESIGN MELT BLOWING DIE
Holly Krutka, Robert L. Shambaugh, Dimitrios V. Papavassiliou, The University of Oklahoma (Norman, OK, USA)

THE RECONSTRUCTIVE METHOD FOR THE ENHANCEMENT OF DEPTH RESOLUTION FOR ACOUSTIC IMAGE USING THE SPATIAL FREQUENCY RESPONSE IN NPPS' MATERIAL
Kil-Mo Koo, Sang-Baik Kim, Dong-In Oh, Chi-Seung Park, Soon-Sin Hong, Korea Atomic Energy Research Institute (Daejeon, KOREA)

4th International Symposium on Computational Technologies for Fluid/Thermal/Chemical/Stress Systems with Industrial Applications

SESSION 4.4O (FSI-11S)

Date: August 8, 2002 Time: 4:00PM – 5:45PM Room: Regency A

Session Title: 4th INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL TECHNOLOGIES FOR FLUID/THERMAL/CHEMICAL SYSTEMS WITH INDUSTRIAL APPLICATIONS:
XIX: VARIOUS INDUSTRIAL APPLICATIONS OF CFD (4)

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SEMI-EMPIRICAL APPROACH TO PREDICTING TEMPERATURES OF A NON-OPAQUE SURFACE
Bob Bush, Shu Li, Kaiser Electronics (San Jose, CA,USA)

A TECHNIQUE FOR DEVELOPING A PRECISE THERMAL COMPACT MODEL
Keishi Okamoto, Kohji Koyamada, Masanori Kuzuno, Toshihiko Nishio, Hidetoshi Kotera
Kyoto University (Kyoto, JAPAN), IBM JAPAN Ltd (JAPAN),

NUMERICAL SIMULATION OF A SPECIALTY OPTICAL FIBRE DRAWING PROCESS
Katja Lyytikäinen, Peter Råback, Juha Ruokolainen, The University of Sydney (Eveleigh, NSW, AUSTRALIA), CSC – Scientific Computing Ltd (Fspoo, FINLAND)

CFD APPLICATION TO CONSTRUCTION OF HAZARD MAPS OF VOLCANIC ERUPTIONS
T.Saito, H.Yamashita, K.Takayama, Tohoku University (Sendai, JAPAN)

ADVANCED HYDRODYNAMIC DESIGN OF VERTICAL DIFFUSER PUMPS USING COMPUTATIONAL FLUID DYNAMICS
K. Michaelides, A. Tourlakis, Cranfield University (Cranfield, UNITED KINGDOM)

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