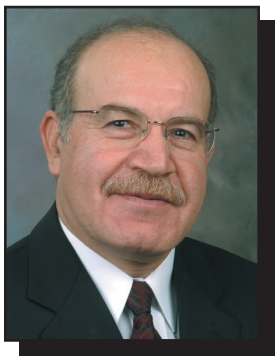
ASME
SETTING THE STANDARD

Fluids Engineering

The Fluids Engineering Division is involved in all areas of fluid mechanics, encompassing both fundamental as well as applications

Chair's Message



By M. H. Hosni, Ph.D.

Dear Colleagues,

Serving as the Chair of the Fluids Engineering Division (FED) this year has been an honor and pleasure for me. The FED is fortunate to have many dedicated members who have selflessly donated many hours of their precious time to serve the Division in different capacities. The Division has a history of being one of the most vibrant technical divisions of ASME and has enjoyed strong leadership of past and present leaders who served and continue to serve as chairs of six technical committees, honors and awards committee, Freeman scholar award committee, young engineer paper contest committee, editor and associate editors of the *Journal of Fluids Engineering,* newsletter editor, and members of the executive committee. The 2010–11 year has been a great year for the Division as we have witnessed continued growth, exciting collaborations, and strong financial outlook.

At the outset, I would like to acknowledge that publication of this newsletter is not possible without considerable amount of time and coordination from the newsletter editor and contributors. I am grateful that Dr. Ramin Rahmani from A. O. Smith Water Product Company is serving as the newsletter editor and my sincere thanks to my colleagues who have contributed articles for this newsletter.

The primary conference activities of the Division are its participation in the International Mechanical Engineering Congress and Exposition (IMECE) and the Fluids Engineering Summer Meeting (FEDSM). The FEDSM is currently on a four year cycle as follows: year 1 solely sponsored by FED, year 2 co-sponsored with the European societies, year 3 co-sponsored with Japan (JSME), and year 4 cosponsored with the ASME Heat Transfer Division.

The 2010 summer meeting was held in Montreal on August 1–5. This conference was co-sponsored by the European Mechanical Engineering Societies with the support and leadership of Drs. Jean Bataille of France, Martin Sommerfeld of Germany, Alfredo Soldati of Italy, Harry Hoeijmakers of the Netherlands, and Michael Reeks of UK. In addition, the International Conference on Nano-Micro- and Mini-Channels chaired by Prof. Satish Kandlikar of Rochester Institute of Technology and the International Conference on Fluid Structure Interactions chaired by Prof. Michael Paidoussis of McGill University in Canada participated in this conference. This collaborative conference attracted considerable interest with

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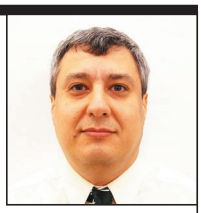
Spring 2011 Newsletter

Ramin Rahmani, ***Editor***



Chair's Message (continued from page 1)

over 1000 abstracts from over 2000 coauthors representing 44 countries. The conference had five plenary lectures delivered by outstanding speaker including Prof. Harry Goldsmith, formerly of McGill University, Prof. Parviz Moin of Stanford University, Prof. Christophe Bailly of Ecole Centrale de Lyon (ECL) in France, Prof. Kemal (Kemo) Hanjalic of Sapienza University, Rome, Italy, and Dr. Paul Cooper of the Flowserve Corporation (retired). Furthermore, Prof. Michael W. Reeks of Newcastle University, Newcastle upon Tyne, UK, delivered the Freeman Scholar Lecture. Chairing this conference was a great pleasure for me. Dr. David Halt served as the technical chair for the conference.

This year's conference is hosted by our Japanese colleagues, through the Japanese Society of Mechanical Engineers (JSME) with collaborations from our Korean colleagues of KSME. The conference will be held in Hamamatsu, Japan, in July 24–29, 2011. Dr. David Halt (FED-ASME), Prof. Yoichiro Matsumoto (JSME), and Prof. Kwang-Yong KIM (KSME) are the Conference Co-Chairs. The abbreviated conference name is AJK2011 and the conference website link is at: http://www.ajk2011-fed.org/

The 2012 summer conference is being developed with collaboration from the Heat Transfer Division and the former Nano-Micro- and Mini-Channels Conference will be officially merged with the two divisions. The Conference Co-Chairs are Dr. Jinkook Lee from FED and Dr. Roy Hogan from HTD. The conference name is HTFNMM 2012.

I am grateful to the technical committee chairs and administrative committee chairs that are providing excellent leadership for the Division. This year's technical committee chairs are Dr. Zheng (Computational Fluid Dynamics), Dr. Walters (Fluid Applications and Systems), Dr. Vlachos (Fluid Measurements and Instrumentation), Dr. Bayandor (Fluid Mechanics), Dr. Dutta (Micro and Nano Fluid Dynamics), Dr. Duignan (Multiphase Flow). Dr. Yu-Tai Lee is the chair of the Honors and Awards committee, Dr. Michaelides is the Chair of the Freeman Scholar Standing Committee, and Dr. Andrews is the Technical Editor of the *Journal of Fluids Engineering*.

The Fluids Engineering Division is indebted to highly dedicated staff at ASME Headquarters. Many thanks to Erin Dolan, FEDSM Conference Manager, Jacinta McComie-Cates, Administrator, Lee Hawkins, Senior Program Manager, and Stacey Cooper, Nhora Cortes-Comerer, and Angeline Mendez, Publications for their continued support of the Division.

We invite and welcome all members including student members to become engaged in the FED activities. More information on the Fluids Engineering Division and past newsletters are located on the Division website at: http://divisions.asme.org/FED/ Once again, I thank you very much for your interest and support. ■

Best regards,
M. H. Hosni, Ph.D.
Executive Committee Chair
Fluids Engineering Division

Report on ASME *Journal of Fluids Engineering*

By Malcolm Andrews, Technical Editor of the JFE

I am pleased to write this report about the progress with the ASME *Journal of Fluids Engineering* (*JFE*). It has now been just over 16 months since I took over the Editorship of the *Journal of Fluids Engineering* from Joe Katz, and it has been a busy time. In the paragraphs below I have taken the opportunity to report the progress of the *Journal*, our current efforts to improve responses to authors, and give some directions on how best to submit articles. During 2010 the *Journal* had a total of 426 submissions, of which to date 79 have been accepted and another 78 are in progress. These statistics compare well with 2009, and indicate that we are on-track to accept about 25% of papers submitted 2010. Moreover, during 2010 we had 5 Associate Editors finish their terms of service, and I send my sincere thanks for all the hard work to Drs. Ian Eames (2007–2010), Theodore Heindel (2005–2010), James Liburdy (200–2010), Chunill Hah (2006-2011), and Ugo Piomelli (2004–2010). I am also pleased to announce that 9 new Associate Editors have agreed to join the *JFE* namely, Ye Zhou (2010–2013), Peter Vorobieff (2010–2013), Charlie Zheng (2010–2013), Ismail Celik (2010–2013), D. Keith Walters IV (2010–2013), Kendra Vail Sharp (2010–2013), Mark Tachie (2011–2014), Mark Duignan (2011–2014) and John Abraham (2011–2014). We also have recruited 2 guest editors: Ali Beskok (2011–2012) and Edward Son (2011–2012) to help with some special situation submissions. With our submission rate presently running at about 20% above 2010, all of the Associate Editors will be busy!

As with all fluid systems, the *Journal* is changing with the intent to increase submission, quality, and response to authors. To this end we have instituted a policy of Editor "pre-screening" papers when they are first submitted to give quick feedback about manuscripts that are obviously deficient. Such deficiencies typically include: poor English; formating asa conference publication rather than for the *Journal* {https://journaltool.asme.org/Help/AuthorHelp/WebHelp/JournalsHelp.htm}; "work-in-progress" rather than completed; "observational" conclusions rather than careful analysis and discussion; and, use of commercial softwareto create a "report" rather than an archival set of results of value/use to the *JFE* readership. To help authors with the criteria for use of commercial software the *JFE* published an article {Andrews, M., "Guidelines for Use of Commercial Software and Diagnostics in Articles for the *Journal of Fluids Engineering*," *Journal of Fluids Engineering*, vol. 133, iss. 1, pp 010201–010202.}, and I strongly encour-

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Report on ASME *Journal of Fluids Engineering*

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age authors to review that article for helpful guidance and to pay attention to the ASME requirement on reporting numerical uncertainty {Celik, I.B., Ghia, U., Roache, P.J., Freitas, C.J., Coleman, H., et al, "Procedure for Estimation and Reporting of Uncertainty Due to Discretization in CFD Applications," *Journal of Fluids Engineering*, vol. 130, iss. 7, pp 0780011–0780014.}. Furthermore, Associate Editors have been encouraged to do their own pre-screen, with more technical depth, prior to sending to reviewers, and to let authors (or the editorial office) know of any deficiencies that might significantly impact the likelihood of a successful review. The spirit of these pre-screenings is to provide faster feedback to authors, and to provide better quality papers for reviewers to consider (our reviewers are some of our future authors). Another initiative is to encourage authors, whose conference papers have been ranked "journal quality," to consider extending their paper and submitting to the *Journal* (after formatting to the *Journal* requirement). It is my experience that most conference papers report "work-in-progress" and typically need additional results before they become of archival value. So the submission of a conference paper straight to the *Journal* (after the conference) is likely to be unsuccessful under a pre-screen or review. However, I believe a closer coupling of conferences to the *Journal* will prove beneficial to both. One last significant change concerns excess page charges, these charges will no longer be assessed, but the (substantial) colorprint charges will remain. Thus, the previous limit of 9 journal pages is no longer in effect, but authors should be careful of excessively long papers where readers might lose interest.

I close by thanking my editorial board of Associate Editors and the editorial office for all their hard work. Please feel free to contact the editorial office at JFE.EditorialOffice@gmail.com if you have any questions. If you see me at a conference, please do not hesitate to visit. ■

Best regards,
Malcolm Andrews
Technical Editor
ASME *Journal of Fluids Engineering*

FED Committee Reports

Fluid Mechanics Technical Committee (FMTC)

Javid Bayandor, Chair
Kamran Siddiqui, Vice-Chair

FMTC leads a broad spectrum of fluid mechanics related activities within the ASME Fluids Engineering Division (FED). The Committee oversees the organization of ten symposia during the Fluids Engineering Division Summer Meeting (FEDSM) and four symposia during the International Mechanical Engineering Congress & Exposition (IMECE). In the past two years, the Committee has also worked with the FED Executive Committee to help identify prominent plenary talks to complement its technical programs during the summer meetings in Vale, CO, in 2009 and Montreal, QC, Canada, in 2010.

The Franklin P. and Caroline M. Johnson Professor of Mechanical Engineering, Parviz Moin of Stanford University was the FMTC's invited plenary speaker for FEDSM2010. Professor Moin's remarkable talk focused on "High fidelity computation of complex turbulent flows," which covered many aspects of contemporary numerical issues aiming to predict the multi-physics of complicated turbulent phenomena. During his talk, Professor Moin indicated the importance of adherence to higher conservation principles and grid quality that can help alleviate the adverse role that numerical errors can play when dealing with turbulence-associated disturbances. Further to that, major examples in support for the validations of the unstructured mesh models developed by Professor Moin's team within the Center for Turbulence Research (CTR) were presented.

The theme of the ASME, JSME, KSME Joint Fluids Engineering Conference 2011, to be held between July 24 to 29 in Hamamatsu, Japan, revolves around Industry-Academia-Government under the banner of "Global Collaboration in Advanced Fluids Engineering: Innovation for Sustainability, Environment and Energy." For this event, FMTC is proud to announce that Professor James Riley, Professor of Mechanical Engineering and Adjunct Professor of Applied Mathematics at the University of Washington, will be the joint FMTC/CFDTC invited plenary speaker. In his talk, Professor Riley will discuss "Some Fluid Dynamical Issues in the Siting of Turbines for Tidal Energy." Further details about the conference and its technical program can be found at www.ajk2011-fed.org.

In the past year, the membership of FMTC alongside the other FED technical committees has had an opportunity to revisit its respective By-Laws approved back in the year 2000. The new draft incorporating addendums to the terms of office, new elections, and other committee/sub-committee responsibilities and affairs has been officially submitted to the FED Executive Committee for consideration and approval. Additionally, an FMTC officer election, coinciding with the summer meeting, was held in Montreal in July 2010. During this event, having completed her two year term in office, Professor Francine Battaglia from Virginia Tech stepped down as the chair of FMTC. The FMTC members unanimously thanked Professor Battaglia for her dedication and outstanding services to the committee. Under Professor Battaglia, FMTC became the first technical committee to propose and adopt the symposium-only format to unify the organization of all its affiliated events. Professor Battaglia further made some important changes to streamline the technical activities of FMTC and facilitate the promotion of the committee outside FED and recruiting new members. She has since been appointed to the FED Executive Committee. Subsequent to Professor Battaglia's departure, Professors Javid Bayandor from Virginia Tech and Kamran Siddiqui from the University of Western Ontario were elected by the FMTC members as the chair and the vice-chair of the committee, respectively. Javid Bayandor had served the prior two year term as the vice-chair of FMTC and Kamran Siddiqui has been an active member of the committee. The next election will be held during FEDSM2012 in Puerto Rico.

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FED Committee Reports: (continued from page 3)

FMTC provides a very exciting platform for its members to be involved in and directly work with the Division as well as the Society. The membership of the committee is open to all professionals from Academia, Government, Industry and Private Sector interested in fluids engineering, who attend relevant ASME events. In FMTC, we continually aim to grow the range of professional activities and services that the committee offers. Realizing our aspirations however is only viable with the help of our devoted membership. We would therefore like to extend an invitation to you to join us to share in the privilege of serving our profession and professional community. We look forward to seeing you in any of our bi-annual committee meetings during FEDSM or IMECE. Please contact Javid Bayandor (bayandor@vt.edu) or Kamran Siddiqui (ksiddiqui@eng.uwo.ca) with any questions that you might have concerning FMTC.

Last but not least, in view of the latest natural disaster and consequent tragedies, the FMTC wishes to convey the deepest sympathy of its members to our Japanese colleagues, while re-emphasizing its commitment and full support for the upcoming event in Hamamatsu. ■

Multiphase Flow Technical Committee (MFTC)

Mark R. Duignan, Chair
Timothy J. O'Hern, Vice-Chair

To better understand cavitation, the ASME Cavitation Committee was formed in 1937, which has since evolved to, and is currently known as, the Multiphase Flow Technical Committee (MFTC). There is still a strong need to understand the formation of pressure-created gas bubbles on a surface and the destructive force caused by cyclic stress due to bubble collapse, but in 2011 the field of multiphase, or multicomponent, flow is much larger and more diverse.

The MFTC is made up of a group of engineers, scientists, and especially young professionals interested in advancing knowledge in all aspects of multiphase flow. Because the area is so broad it touches many other disciplines, to include Heat Transfer, Acoustics, Manufacturing, Combustion, Bioengineering, Micro/Nano-Electomechanical systems, to name a few. Our main vehicle to bring the multiphase community together is to create, sponsor, and organize symposia and fora at engineering conferences: the International Mechanical Engineering Congress & Exposition (IMECE) and the Fluids Engineering Division (FED) Summer Meeting (FEDSM). The latter is the principal venue for MFTC activities.

This year is shaping up to be very exciting. The summer meeting, FEDSM2011, will be far reaching and for 2011 is also known as AJK2011 [or the American Society of Mechanical Engineers - The Japan Society of Mechanical Engineers - The Korean Society of Mechanical Engineers Joint Fluids Engineering Conference]. It will be in Hamamatsu, Japan, July 24–29 [see http://www.ajk2011-fed.org/]. Every four years the Fluids Engineering Divisions of ASME and JSME hold a joint conference and for 2011 this will be the 6th meeting. However, this year KSME will also participate, so that this will be the 1st joint ASME-JSME-KSME FED meeting and the first time to be held in Japan. The MFTC will play an integral part of AJK2011 with 5 symposia and 2 fora:

- 12th International Symposium of Gas-Liquid Two-Phase Flows
- 13th International Symposium on Gas-Particle Flows
- 11th International Symposium on Numerical Methods for Multiphase Flow
- 12th International Symposium on Liquid-Solid Flows
- Symposium on Non-Invasive Measurements in Single and Multiphase Flows *(co-sponsored with FMITC)*
- 46th Cavitation and Multiphase Flow Forum
- Open Forum on Multiphase Flows: Work in Progress

MFTC will be also active at IMECE2011 in Denver, Colorado, Nov. 11–17 [see http://www.asmeconferences.org/Congress2011/] to include sponsoring two fora:

- 7th Forum on Recent Developments in Multiphase Flow
- Noninvasive Measurements in Single and Multiphase Flows Flows (co-sponsored with FMITC)

Next year the MFTC will celebrate its 75th year of existence and we hope to mark the occasion at FEDSM2012 to be held in Puerto Rico. Come join us in 2011 and 2012 as we are always pleased to welcome new and active members. Please feel free to contact the chair, Mark Duignan at mark.duignan@srnl.doe.gov or the vice-chair, Tim O'Hern at tjohern@sandia.gov. ■

Fluid Applications and Systems Technical Committee (FASTC)

Keith Walters, Chair
Wayne Strasser, Vice Chair

The mission of the Fluid Applications and Systems Technical Committee (FASTC) is to promote the advancement and dissemination of fluids engineering research and technology in several wide-ranging single- and multi-disciplinary topic areas. These include such traditional disciplines as fluid power systems, turbomachinery, automotive flows, and industrial fluid mechanics, and can include less traditional topics such as environmental engineering, geophysical flows, chemical processing, or fluid vibrations and acoustics. The primary function of the committee is to coordinate and organize research symposia at two major venues for fluids engineering — the annual ASME Fluids Engineering Division Summer Meeting (FEDSM) and the ASME International Mechanical Engineering Congress and Exposition (IMECE) — as well as other FED sponsored meetings and events. Researchers and engineers from academia, industry and government are encouraged to meet and exchange information on these and other topics through their participation in FASTC.

We will sponsor two recurring symposia at the ASME-JSME-KSME Joint Fluids Engineering Conference in Hamamatsu, Japan, July 24-29, 2011. These include the 23rd Symposium on Fluid Machinery and the 18th Symposium on Industrial and Environmental Applications in Fluid Mechanics. In addition,

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FED Committee Reports: (continued from page 4)

FASTC will co-sponsor the 7th International Symposium on Pumping Machinery, Issues and Perspectives in Ground Vehicle Flows, and 12th International Symposium on Advances in Numerical Modeling for Turbomachinery Flow Optimization. For the 2011 IMECE meeting in Denver, USA, November 11–17, FASTC will sponsor the 20th Symposium on Industrial Flows and once again co-sponsor the Symposium on Turbomachinery Noise with the Aero/Hydro Acoustics Committee of the Noise Control and Acoustics Division (NCAD).

We were pleased to have new members attend the FASTC meetings at FEDSM and IMECE in 2010. We continue to encourage all interested individuals from academia and industry to participate in the FASTC activities, and especially to attend our symposia and technical committee meetings. If you are interested in volunteering with the committee, or if you have any questions or concerns, please don't hesitate to contact the Chair, Keith Walters at Mississippi State University (walters@me.msstate.edu) or the Vice Chair, Wayne Strasser at Eastman Chemical Company (strasser@eastman.com). ■

Micro- and Nano-Scale Fluid Dynamics Technical Committee (MNFDTC)

Prashanta Dutta, Chair
David Sinton, Co-chair

It was another great year for micro- and nano-scale fluid dynamics at the IMECE. This year the micro/nano fluid dynamics sessions had a total of 59 talks with 27 papers presented in Track 10-11 and 32 papers presented in Track 13-9. The sessions were well attended and there was excellent discussion following the talks. Canadian members of the technical committee advertised the Forum extensively to increase involvement of Canadian researchers in the conference, and the contributions from Canada were up significantly as a result. The 2010 Microfluidics forum was organized by Peter Huang of Binghamton University with help from Chang-Hwan Choi of Stevens Institute of Technology, and David Sinton of University of Victoria. Chang-Hwan is taking the lead for 2011, with help from Jiang Zhe.

Invited talks are an important part of the IMECE meeting, and this past year the Forum attracted outstanding researchers Dr. Paul Yager and Dr. Carl Hansen to the event. Dr. Paul Yager is a world-leading researcher in microfluidics, and microfluidics for public health, and he gave a talk on "Point-of-Care Diagnostics for Global Health". Dr. Carl Hansen is an established expert in microfluidic systems for applied and fundamental research in genomics and cell biology. Carl gave a talk on "Microfluidic Tools for Studying Single Cell Responses". Both researchers gave an interesting and engaging talk and participated in discussions and networking. These speakers were brought in by the keynote committee of David Sinton, Prashanta Dutta and David Erickson. This coming years' invited talks will be organized by Kendra Sharp, Prashanta Dutta and David Sinton.

For the first time this year, the Forum featured a Microfluidics Social. The social event was scheduled immediately following the technical committee meeting, and was held in the lounge of the Fairmont Waterfront Hotel. The social was well attended by students, faculty, and invited speakers and was a great chance for attendees to meet and network in a relaxed setting. As the response was very positive, the committee is adding this function to future events.

The Forum also has two awards: a Best Paper Award and a Best Student Presentation Award. Prof. Steven Wereley's group was awarded the Best Paper Award for their work on the "Application of an Optically Induced Electrokinetic Manipulation Technique on Live Bacteria." Carlos Escobedo was awarded the Best Student Presentation Award. To select the best presentations and papers, feedback from session chairs is collected and compiled by the awards committee including David Sinton, Prashanta Dutta and Kendra Sharp.

The Micro/Nano Society-wide Poster Forum was also a success this year and attended by many Microfluidics Forum participants. This forum, organized by Tony Huang, has become an important part of the conference experience for the Micro/Nano community.

This year the Fluids Engineering Summer Meeting is being jointly sponsored with the Japanese Society of Mechanical Engineers and the Korean Society of Mechanical Engineers in Hamamatsu, Japan. Prof. Steve Wereley is coordinating the Microfluidics Forum on behalf of the ASME Micro/nano Fluid Dynamics Technical Committee. A number of the MNFDTC committee members are participating either by presenting key notes or presenting oral or poster submissions. Prof. Min Jun Kim, Drexel University, will run the Micro/nano Fluid Dynamics Technical Committee meeting in the Fluids Engineering Summer Meeting.

In 2011, the IMECE will be held in Denver, Colorado, and the organizers are currently processing the papers and sessions for this event. The Micro and Nano Fluid Dynamics Technical Committee is looking forward to the meeting and broadening the impact of the division. ■

Computational Fluid Dynamics Technical Committee (CFDTC)

Z. Charlie Zheng, Chair
Raymond Gordnier, Vice Chair

While the CFDTC was revising the Bylaws, it was interesting to find out some history of the TC. The committee originated as the Coordinating Group on Computational Fluid Dynamics (CGCFD) in 1988 within the FED. In July 2002, the CGCFD was renamed the CFDTC by the FED. The focus of the CFDTC is the field of computational fluid dynamics and related areas. The overall objective of the CFDTC is to develop, promote, coordinate and disseminate information relating to the successful and accurate application of CFD to problems of interest and importance to the research community as well as to industrial users and other practitioners. Membership is open to anyone who is interested in participating in the activities of the CFDTC.

The CFDTC usually meets two times a year: one at the summer FED meeting and the other at the IMECE meeting. This last year these two meetings happened to be both in Canada. We met in Montreal in August and Vancouver in November.

At the Montreal meeting, the CFDTC sponsored 6 symposiums: 10th Symposium on Applications in CFD, Sympo-

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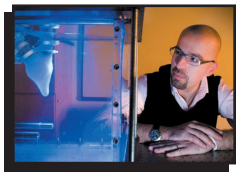
FED Committee Reports: (continued from page 5)

sium on Development and Applications of Immersed Boundary Methods (new), Symposium on CFD Verification and Validation (co-sponsor), Symposium on Algorithm Development in CFD, 11th International Symposium on Fluid-Structure Interaction and Flow-Induced Noise in Industrial Applications, and Symposium on DNS, LES, and Hybrid RANS/LES Methods.

At the Vancouver meeting, in order to widen the participation of the CFDTC and cultivate the inter-disciplinary interactions between the CFDTC and the other disciplines at the IMECE, a new forum was established, Forum on CFD Algorithms and Applications for Flow Optimization and Controls. The first Forum at the Vancouver meeting had 4 sessions with 24 papers. We expect to have more participants at the 2011 IMECE in Denver, CO.

We welcome you to be part of the CFDTC, by coming to our TC meetings, presenting at our symposiums, or volunteering in whatever ways. If you have questions, comments, or suggestions, please feel free to contact the CFDTC Chair Z. Charlie Zheng (zzheng@ku.edu) or Vice Chair Raymond Gordnier (Raymond.gordnier@wpafb.af.mil). ■

Fluid Measurements and Instrumentation Technical Committee (FMITC)



Pavlos Vlachos, Chair

Hui Hu, Vice Chair

The mission of the Fluid Measurement and Instrumentation Technical Committee (FMITC) is to provide a venue for the Fluids Engineering Division (FED) to focus on measurement and instrumentation issues relevant to fluid flows. Modern fluids engineering embraces a complex spectrum of problems from the relatively simple case of isothermal, incompressible, single phase flow of Newtonian fluids to non-Newtonian multiphase flows with heat and mass transfer from the nanoscale to the macroscale. Experimental measurements and instrumentation are required in all cases to verify new theories, to certify the performance of fluid machinery, or to obtain fundamental information on processes to guide and validate the development of analytical and numerical models.

The FMITC was originally organized under the Coordinating Group for Fluid Measurements (CGFM) for the purpose to foster technical and professional development activities in the area of fluid measurements in both laboratory and field measurements. FMITC is responsible to organize, promote, and present symposia, forums, and panel discussions on fluid measurements. The committee meetings of FMITC are held twice a year at the IMECE and the FED Summer Meeting. The time and date of these meetings are announced in the conference program.

In the summer of 2010, FMITC has revisited its By-Laws approved back in the year 2000. The revisions include addendums to the terms of FMITC officers, new elections, and other committee/sub-committee responsibilities and affairs, which has been officially submitted to the FED Executive Committee for approval. FMITC officer election, coinciding with the FED summer meeting, was held in Montreal, Canada in July 2010. After having chaired the FMITC for the past 4 years, Professor Ted Heindel from Iowa State University stepped down as the chair of FMITC. The FMITC members unanimously thanked Professor Ted Heindel for his exceptional service to the FMITC committee. Professor Pavlos Vlachos from Virginia Tech and Professor Hui Hu from Iowa State University were elected by the FMITC members as the chair and the vice-chair of the committee, respectively.

FED Summer meeting in 2011 is co-organized by ASME, JSME and KSME and is referred to as AJK 2011, which will be held on July 24-29, 2011 at Hamamatsu, Japan. FMITC will organize following symposium and forum as an integral part of the AJK2011 conference:

- Symposium on Non-Invasive Measurements in Single and Multiphase Flow
- Forum on Fluid Measurements and Instrumentation

Further information about the symposium and forum is available at http://www.ajk2011-fed.org/

FMITC will also be active at IMECE2011 to be held on Nov. 11–17, 2001 at Denver, Colorado to organize or co-sponsor following forums and symposiums:

- Fluid Measurements and Instrumentation
- Noninvasive Measurements in Single and Multiphase Flows
- Panel on Flow Measurement Uncertainty
- CFD/EFD (Experimental Fluid Dynamics) Choice - Dilemma for Industries
- Symposium on Sensors and Measurements in Thermo-Fluid Systems (?)
- Forum on Fluid Measurement Validation and Verification (?)

Further information about the symposiums and forums is available at http://www.asmeconferences.org/congress2011/

The membership of FMITC is open to all professionals from Academia, Government, Industry and Private Sector interested in fluid measurement and instrumentation. If you are interested in joining FMITC or receiving announcements and/or notification of FMITC sponsored meetings and symposiums, please write to the FMITC chair, Professor Pavlos Vlachos at pvlachos@vt.edu or the vice chair, Prof. Hui Hu at huhui@iastate.edu. ■

Basic Engineering Technical Group (BETG)

Joel T. Park, Ph. D., Senior Member and FED Chair 2009-10

In the 2010 newsletter, Jim Liburdy(FED Chair 2008–09) first wrote about the Basic Engineering Technical Group (BETG). Five other divisions are represented in the BETG: Applied Mechanics Division, Bioengineering Division, Heat Transfer Division, Materials Division, and Tribology Division. The bylaws for BETG were approved recently. Business of the BETG is conducted by the Operating Board. The Operating Board consists the Technical Group Leader, Vice-Chair, two representatives from each of the divisions, and Members at Large (MAL) representing Division Operations, Board Operations, Strategic Planning, Honors and Awards, Conference Planning, and Publications and Communications. Jinkook Lee and myself from FED are our representatives on the Operating Board. Currently, the Senior Member and Secretary of the Executive Committee are the designated representatives, and we serve for one year. The MAL representatives each serve for a three-year term. Additional details of BETG may be found on the ASME web page at http://divisions.asme.org/BETG/. The BETGOB conducts its routine business by email and monthly telephone conference calls.

The BETGOB meets in person three times a year, once at IMECE and twice at the Congress of Divisions (COD), which is a meeting of all divisions within ASME. Our first meeting of COD was in Newark, New Jersey, on September 24 and 25, 2010, and the second in Dallas, Texas, on March 3, 2011, in conjunction with the 2011 Leadership Training Conference (LTC). On the morning of March 4, we had an informal breakfast meeting with other members of the FED Executive Committee that were in attendance at the LTC. The attendees included Awatef Hamed, Dave Halt, Jinkook Lee, George Papadopoulos, and myself. One of the topics of discussion was the location of FEDSM2013. Awatef will the conference chair. George (FED Chair 2007–08) is currently the Vice-Chair of the BETGOB and will become Technical Group Leader in the near future. Incidentally, Kumar Rohatgi(FED Chair 2002–03) is the MAL for Division Operations.

One of the principal objectives of the BETGOB is to influence ASME policies favorable to the divisions. Prior to my tenure on the BETGOB was the implementation of the on-line copyright form for our conferences. Over the past year, ASME has implemented a new conference policy, ASME Policy 12.1, which impacts our conferences. For additional information on conference planning, see the ASME Conference Planning Committee (CPC) web page: http://committees.asme.org/K&C/CPC/home.cfm. Our MAL representative is Vikas Prakash of Case Western. The CPC is in the process of developing a web tool for the conference planning process. The date for the implementation of the new web tool has not yet been established.

The BETGOB has been approving bylaws for the divisions including its own. The bylaws of the Materials Division were the most recent to be approved. The FED bylaws will be the last to be approved of the six divisions within BETG. The last FED bylaws were revised in April 1994. Jim Liburdy over the past year has been working on updating the bylaws of the FED Technical Committees. Jim's effort and the support of the Technical Committees are much appreciated. I am currently rewriting the bylaws of the Executive Committee. The bylaws are being updated to incorporate our current operations and to conform to Robert's Rules of Order. The Technical Committee bylaws and Division operating procedures will be added as appendices. If you have any questions or comments about BETG, please contact myself or Jinkook Lee. ■

Photographs from FEDSM2010 in Montreal, Quebec, Canada

2009-10 Executive Committee: Mo Hosni, Jim Liburdy, Joel Park, Dave Halt, and Jinkook Lee

Plenary Speakers

Freeman Scholar Award: Tim O'Hern and Mike Reeks *(U. of Newcastle)*

Mike King, Harry Goldsmith *(McGill U.)* and Satish Kandlikar

(continued on page 8)

Photographs from FEDSM2010 in Montreal, Quebec, Canada (continued from page 7)

Francine Battaglia, Parviz Moin *(Stanford U.)* and Javid Bayandor

Jinkook Lee and Paul Cooper *(Flowserve Corp.)*

JSME Organizers for AJK2011

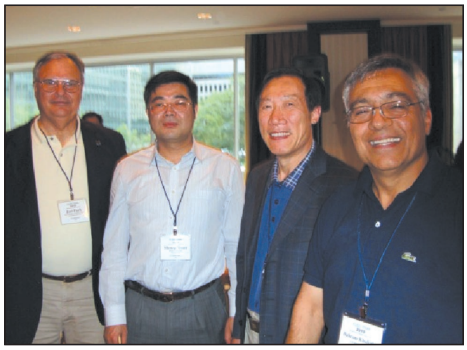
Jean Baille and Christophe Bailly *(Ecole Centrale de Lyon)*

JFE Associate Editor: Ugo Piomelli *(Queen's U.)* and Joel Park

KSME Organizers for AJK2011

Kemal Hanjalic *(Sapienza U.)* and Mike Reeks

Paul Cooper and Joe Katz



Joel Park, Shouqi Yuan *(Jiangsu U.)*, Chao Liu *(Yangzhou U.)* and Bahram Khalighi

Photographs from IMECE2010 in Vancouver, British Columbia, Canada

***JFE* Editor:** Malcolm Andrews, **ASME Staff:** Lee Hawkins and Jacinta McComie, **2010–11 Executive Committee:** Mo Hosni, Dave Halt, Joel Park, Awatef Hamed, and Jinkook Lee

FED Reception — Young Engineer Paper Contest

Malcolm Andrews and Raviraj Thakur (*Purdue U.*, **Third Place**)

Timothy Morgan (*Iowa State U.*, **First Place**)

Aaron Sidens (*Virginia Tech*, **Second Place**)

(continued on page 10)

Photographs from IMECE2010 in Vancouver, British Columbia, Canada (continued from page 9)

Judith Bamberger *(Pacific NW Lab)*, Prashanta Dutta *(Washington State U.)*, and Malcolm Andrews *(Los Alamos)*

Ted Heindel *(Iowa State U.)* and Francine Battaghlia *(Virginia Tech)*

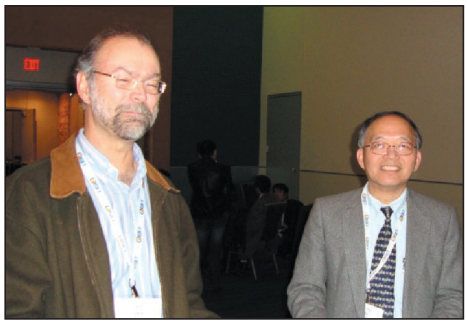
Joe Schetz *(Virginia Tech)*, Karman Ghia *(U. Cincinnati)*, Khaled Hammad *(Dantec)*, and Mike Plesniak *(George Washington U.)*

Karman and Urmila Ghia *(U. of Cincinnati)*, Judith Bamberger *(PNL)*, and Joel Park *(David Taylor Model Basin)*

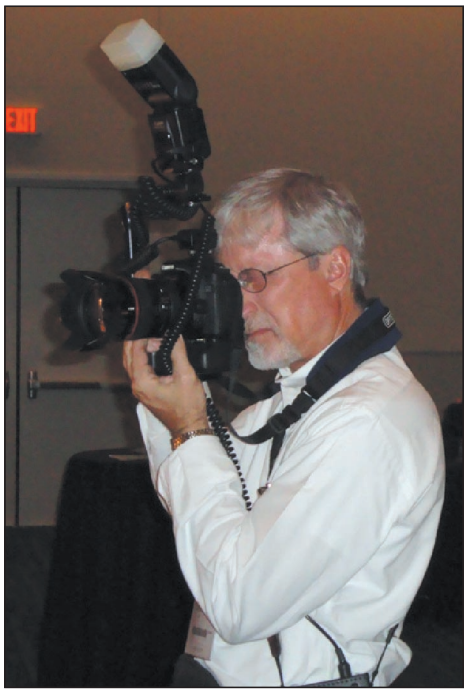
Bahram Khalighi *(GM)*, Judith Bamberger (*PNL)*, Dave Halt *(PAX)*, and Keith Walters *(Mississippi State U.)*

S. A. Sherif *(U. Florida)*, Jinkook Lee *(Eaton)*, Mo Hosni *(Kansas State U.)*, and Keith Walters *(Mississippi State)*

Awatef Hamed *(U. Cincinnati)* and Francine Battaglia *(Virginia Tech)*



Tim O'Hern *(Sandia Lab)* and Yu-Tai Lee *(David Taylor Model Basin)*



Jim MacDonald (ASME Photographer

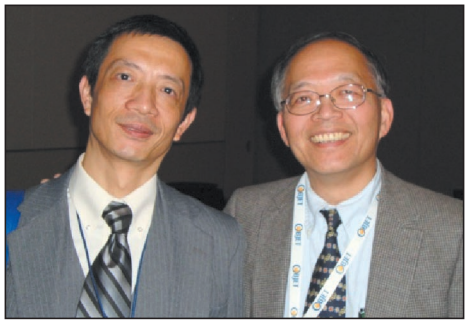
Khaled Hammad *(Dantec)*, unknown, Jim Liburdy *(Oregon State U.)*

George Papadopoulos *(ATK GASL)* and Sushanta Mitra *(U. Alberta)*

(continued on page 11)

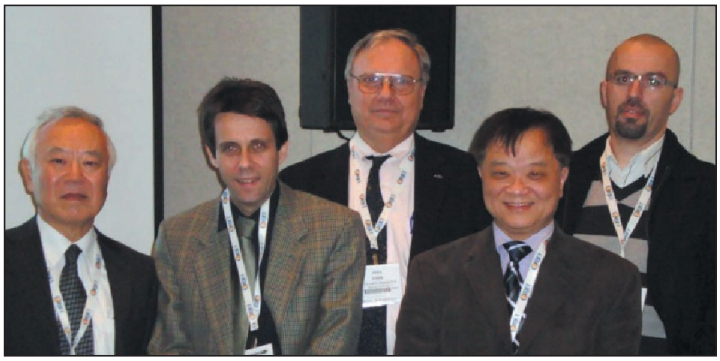
Photographs from IMECE2010 in Vancouver, British Columbia, Canada (continued from page 10)

Wayne Strasser *(Eastman)* and
Mark Duignan *(Savannah River)*



Charlie Zheng *(Kansas State U.)* and
Yu-Tai Lee *(David Taylor Model Basin)*

Channy Wong *(Sandia)* and
Debbie Pence *(Oregon State U.)*



Panel Session 10-4-1: Mamoru Ishii *(Purdue U.)*, Phillipp Epple *(Friedrich Alexander Universitat)*, Joel Park *(David Taylor Model Basin)*, George Huang *(Wright State U.)*, and Pavlos Vlachos *(Virginia Tech)*

2011 ASME-JSME-KSME Joint Fluids Engineering Conference

ACT Congress Center

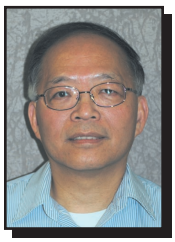
Hamamatsu, Japan July 24–29, 2011

The ASME-JSME-KSME Joint Fluids Engineering Conference 2011 (AJK2011-FED) has grown out of the ASME-JSME Joint Fluids Engineering Conference that was first held in Portland, Oregon in 1991. From a global perspective, the world faces a number of daunting challenges including global climate change, finite energy resources, and economic crises. These problems are wide-ranging and extremely complex. Mechanical engineering and mechanical engineers have the potential to overcome these problems. Three mechanical engineering societies, JSME, ASME and KSME, have been addressing these problems both individually and collaboratively. The ASME-JSME Joint Conference on Fluids Engineering has played a major role in addressing these challenges, but the problems are too complex to solve only through bilateral collaboration. We need global and industry-government-academia collaboration to find the answers. On this basis, the three societies have decided to hold the ASME-JSME-KSME Joint Conference on Fluids Engineering 2011 (AJK2011-FED) in Hamamatsu, Japan. The organizing committee of AJK2011-FED looks forward to the active participation of mechanical engineers and researchers from around the world. There are currently over 800 technical papers in process for this conference.

The AJK conference will be held as scheduled. Please be assured that the conference venue, Hamamatsu, is very safe as it is far away, or 530 kilometers from Fukushima. For access, Central Japan International Airport is the nearest airport to the venue.

FED Awards

Honors and Awards Committee



The Honors and Awards Committee consists of past technical committee chairs. The 2011 Committee members include Dr. Khaled J. Hammad (FMTC) of Dantec Dynamics, Professor Steven T. Wereley (MNFDTC) of Purdue University, Professor Theodore J. Heindel (FMITC) of Iowa State University, Dr. Miguel Visbal (CFDTC) of Air Force Research Laboratory, Professor S. Balachandar (MFTC) of University of Florida, and the Committee Chair Dr. Yu-Tai Lee (FASTC) of Naval Surface Warfare Center, Carderock Division.

Detailed descriptions of the ASME Society and FED Division Awards presented by the Honors and Awards Committee can be found at http://divisions.asme.org/fed/Honors_Awards.cfm.

The following is a brief description of the awards offered and the 2010 recipients

Fluids Engineering Award

The Fluids Engineering Award is conferred upon an individual for outstanding contributions over a period of years to the engineering profession and in particular to the field of fluids engineering through research, practice or teaching. The selectee of the 2010 Fluids Engineering Award was the also the recipient of another ASME division's award. This violates the requirements for the ASME Achievement Awards. Unfortunately the Committee members were not informed of the violation until it was too late to change the selectee. Thus the Award was not offered in 2010.

Robert T. Knapp Award

This award is given for the best paper presented at the Fluids Engineering Division sponsored sessions dealing with analytical, numerical and laboratory research. The 2010 Knapp Award was presented to M. Emst and M. Sommerfeld for their paper entitled: "Direct Numerical Simulations of Colliding Particles Suspended in Homogeneous Isotropic Turbulence," (FEDSM2009-78072). Martin Ernst obtained his diploma from the mechanical engineering at University of Applied Science in Merseburg, Germany in "3D-CFD computations of a power chainsaw filter system with pre-separator" in 2007. Later he works as a research assistant at the chair for Mechanical Process Engineering of the Martin-Luther-University Halle-Wittenberg in Halle, Germany. His research focuses on the development and application of Lattice-Boltzmann-Methods as well as direct numerical simulations of turbulent suspensions. Martin Sommerfeld received his Diploma (Dipl.-Ing) from the aeronautical engineering at the Technical University of Aachen and received his Diploma (Dipl.-Ing) degree in 1981. He accomplished his Ph.D. (Dr.-Ing.) on shock wave propagation through gas-particle mixtures in 1984. He has been with the Kyoto University and the Institute of Fluid Mechanics at the University of Erlangen. After completing a Habilitation on "Modelling and Calculation of Turbulent Two-Phase Flows using the Euler/Lagrange Approach, he became a full Professor of Mechanical Process Engineering at the Martin-Luther-University of Halle-Wittenberg in 1994. He is the recipient of the 1996 DECHEMA Award.

Lewis F. Moody Award

The Lewis F. Moody Award is given for the best paper presented at the Fluids Engineering Division sponsored sessions dealing with a topic useful in mechanical engineering practice. The 2010 Moody Award was presented to A. N. Lahoutl and H. Hangan for their paper entitled "Active Flow Control for Reduction of fluctuating Aerodynamic Forces of a Blunt Trailing Edge Airfoil," (FEDSM 2009-78136). Arash NAGHIB-LAHOUTI received his Master of Science from the Aerospace Engineering, Tehran Polytechnic, Iran and is currently working on his Ph.D. at the Boundary Layer Wind Tunnel Laboratory of the University of Western Ontario, Ontario, Canada. He has been a faculty member at the Sattari Aeronautical University and the Aerospace Research Institute in Iran. Horia Hangan is a Professor and the Director of The Boundary Layer Wind Tunnel Laboratory at the University of Western Ontario, Canada. His research applies to aerodynamics, wind energy, high intensity winds (downbursts and tornados), wind environment and wind effects on structures.

Sankaraiyer Gopalakrishnan—Flowserve Pump Technology Award

The Award was established in July 2006, with funding generously provided by the Flowserve Corporation, in honor of the late Dr. Sankaraiyer Gopalakrishnan, "Gopal". The award is presented biennially in recognition of outstanding achievement in pump technology, documented through publications and testimonials of peers and co-workers and in keeping with Gopal's dedication to the education of the next generation of expert pump engineers.

Fluids Machinery Design Award

The Award, presented biennially, honors excellence in the design of fluid machinery involving significant fluid mechanics principles, which benefits mankind as exemplified by product use within the past decade.

Freeman Scholar Award

The Freeman Scholar Award is given every two years to an eminent contributor to Fluids Engineering. The Committee is looking again for an expert in an area of current interest who is expected to deliver the Freeman Scholar Lecture during the summer meeting and will write an extensive review paper that is published in the *Journal of Fluids Engineering*. The 2011 members of the Freeman Scholar Award committee are Tim O'Hern of Sandia National Laboratories, Dave Stock of Washington State University and Stathis Michaelides of the University of Texas at San Antonio (chair). The 2010 recipient of the Freeman Scholar Award was Professor Michael Reeks of Newcastle University in the United Kingdom who delivered an excellent lecture with the title: "The development and application of the PDF approach for modeling dispersed particle flows."

The Freeman Scholar Award is biennial and is awarded in even years. In 2011 there will not be a Freeman Scholar. This year the committee has opened the competition for the 2012 ASME Freeman Scholar. The deadline for the applications is September 1, 2011 and more details may be found at: http://www.asme.org/about-asme/hold2/about-asme/honors-awards/freeman-scholar-award ■

CFD Investigation of Air-Water Test Stand for Three-Stream Airblast Reactor Feed Injector

Wayne Strasser
Eastman Chemical Company, Kingsport, TN, USA Member, Fluids Engineering Division

Introduction

According to Lefebvre[1] and Lienemann, Shrimpton, and Fernandes[2], the earliest quantification of jet disintegration was carried out by Felix Savart in 1833. Since that time, the breakup and atomization of jets has been of direct importance to, and the subject of great experimental and computational focus within, the agricultural, chemical, food, fire protection, and energy-production industries. In the present work, an airblast nozzle (injector) is used to generate an atomized fuel stream for a large-scale reactor. Three streams are used: inner jet gas, outer annular gas, and an intermediate annular liquid stream. An extremely rich body of previous experimental and computational work on thinning sheets and coaxial jets exists in the open literature. More can be found in Strasser et al.[3] and Strasser[4]. In short, a study directly related to the present work has not been found in the open literature. The objective is to carry out an air-water test stand (AWTS) and a compressible (Mach number >1) VOF-based (geometric reconstruction) CFD study of an airblast atomizer. The presence of three streams in certain combinations produces an inherently unsteady, bursting flow field that requires careful statistical consideration. The effects of various stream flow combinations on the pressure response, flow field, and spray distribution are considered. More than 40 geometric and stream combination permutations have been tested over the past year as part of the overall experimental program, but only 7 will be discussed here. The 7 flow combinations (FC) involve changes in overall rate (involves all flows) and progressively increasing inner air (IA) flow rates (with the other two held constant). In general higher FC designations imply a relatively larger amount of IA. Details on the AWTS and the computational method, including numerics, meshing, convergence, axisymmetric versus 3-D models, and time-averaging issues, can be found in Strasser[4].

Pulsatile Annular Liquid Sheet

The annular liquid film is excited by perturbations from both the inner and outer gas streams. Liquid can be seen peeling off outer and inner edges as well as bulk film fragmentation into ligaments (Dumouchel[5]). There are at least 3 annular film driving frequencies in play here: *i)* shedding on the outside of the film layer from the OA (very fast), *ii)* shedding on the inside of the film layer from the IA (relatively slow), and *iii)* bulk flapping of the film layer (somewhere between the other two). Periodically, but not necessarily at regular intervals, the three frequencies tune together to produce five different types of pulsation events:

1. **"Normal" bursts** – The spray comes axially down away from the feed injector and then spreads normal to the feed injector face. The burst throws droplets radially outward. It can be seen in CFD and the AWTS video that this occurs at a frequency of about 200 Hz. A series of these can be observed occurring in the "Christmas tree" pattern in Figure 8.
2. **"Half" bursts** – For this event, the spray is only slung radially outward about half the radial distance of that of the normal burst. There are maybe three of these events occurring for every normal burst.
3. **"Necking only"** – Here, the stream radially narrows, but no outward bursting event occurs. There are approximately nine of these events for every normal burst.
4. **"Blowback"** – Approximately every 50 or so normal bursts is a blowback event, when the spray is thrown so violently outward that some of it actually moves axially in reverse and splashes back on the injector face. The strength and frequency of these events depends ***strongly*** on FC and feed injector geometry.
5. **Inner gulps** – This can only be observed in the CFD videos since the AWTS videos only allow the visualization from the outside of the spray. In this event, liquid bridges over the IA stream and is splashed back up into the IA inlet. The gulps occur at around 80 Hz.

Spray Pattern Metrics

The three spray pattern metrics for bursts are shown in Fig. 1. AWTS video snap shots are shown on top of CFD video snapshots. The only difference between the left and right is just that different dimensions are being highlighted. A" is the "neck width", B" is the "neck distance", and C" is the "shoulder distance." The neck width is measured at the thinnest neck of an event, at which point the neck distance off the injector face is also measured. The shoulder distance is measured from the injector face to the outer edge of the spray at the onset of another burst event. Of course, the AWTS videos show more droplets while CFD videos show more ligaments, so any metrics need to be comparable to one another from both video methods. It was for this purpose that these particular metrics focus on the continuous part of the annular liquid sheet. Manual frame-by-frame analysis is required to first find the event, and then to take said measurements. A series of multivariate

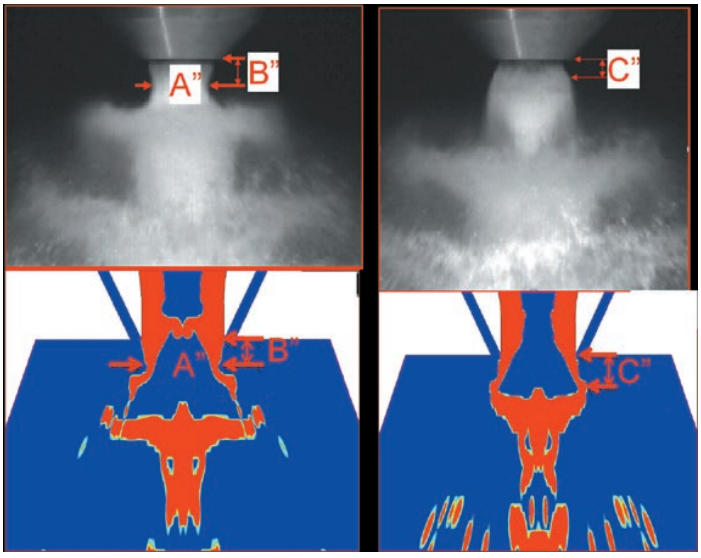


Fig. 1: *Spray metrics showing AWTS snap shots (top) and CFD snapshots (bottom) for the purpose of illustrating the particular dimensions sought.*

CFD Investigation of Air-Water Test Stand for Three-Stream Airblast Reactor Feed Injector (continued from page 13)

analyses of variance (MANOVA) were carried out.

- For measures A" and C", the value tends to be reduced by an increase in IA. This is counter-intuitive and says that the opening of the spray by increasing inner air tends to make *narrower* bursts *closer* to the feed injector face.
- For measure B", the value tends to increase with increasing IA. This is more intuitive and says that the opening of the spray by increasing inner air tends to make bursts occur *farther away* from the feed injector face.

Water Collection Profiles (Spray Angle)

Water collection in the AWTS and CFD took place in an attempt to make directional comparisons in the effect of FC on spray angle. The project involved many more permutations than those shown here, and project duration was of immense importance. Figure 2 shows the resulting AWTS water collection profiles for FC3, FC5, FC6, and FC7. The only difference between an "A" and "B" curve, where applicable, is that the data were taken at different times. Environmental conditions played a role in the results, although each "A" profile was reasonably close to its "B" counterpart. FC3 clearly has a unimodal distribution, FC5 has a trimodal distribution, and FC6 (high IA, low rate) has something between a bimodal and trimodal distribution; it is either a weak trimodal or an off-center bimodal. In any event, FC5 is almost indistinguishable from FC6. FC7 (high IA, high rate) seems to be leaning back towards unimodal, but remains trimodal with an extremely strong center peak. This is especially interesting, because it implies there is a strong interaction between overall rate and IA. If the profile is not shown here, it can be assumed that it was unimodal. Overall, this says that the IA has to be above the critical regime in order to produce a multimodal profile. The CFD profiles can be found in Strasser[4].

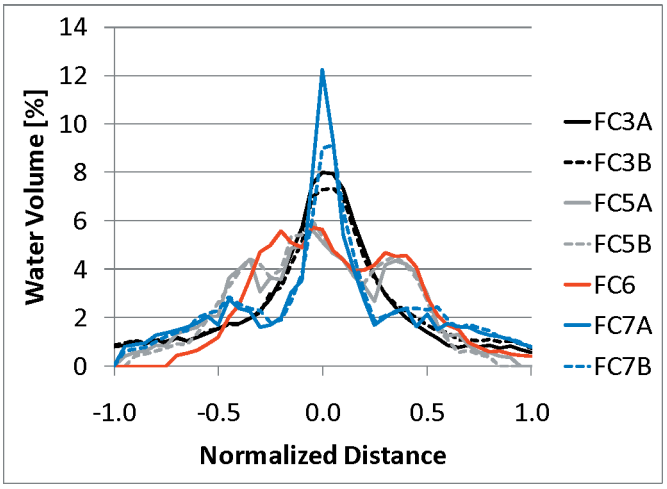


Fig. 2: AWTS water collection profiles for four flow combinations.

Conclusions

An experimental and computational program has been executed to characterize the flow field produced by a three-stream airblast reactor injector at various stream flow combinations. In short, our CFD method (at this stage of development) cannot be used as a replacement for AWTS work, but it can be used to "screen" designs before spending the time and money to test them in the AWTS. Much more frequency spectra analysis can be found in Strasser.[4]

- Three distinct frequencies are at play to produce a liquid spray: shedding at the outer air/film interface, shedding at the inner air/film interface, and the bulk flapping of the annular liquid film. The tuning of these three driving frequencies produces five types of pulsation events: normal bursts, half bursts, necking only, blowback, and inner gulps. The existence and frequency of these events depend on the stream flow combinations.
- Depending on the relative amount of inner air flow, there seem to be three overall flow regimes. Low IA flows produce regular normal bursts. Moderate IA flows produce all five burst events along with violent AWTS feed piping network pulsations. Higher IA flows produce all five events, but do not exhibit violent feed network pulsations. Somewhere near 0.71 IA flow appears to be the transition point, and it shows the largest fluctuations in IA feed pressures. Removing the IA completely causes bursts to stop all together. These are consistent between the AWTS and CFD.
- Water spray collection profiles from AWTS reveal that at low IA flows, the spray pattern is unimodal. At higher flows it becomes bi- or trimodal. There might be an interaction between IA flow and overall air delivery. The CFD spray pattern results track some of the AWTS flows directionally, while not others. Both sets of results show multimodal results above 0.71 IA flow.
- Three different video analysis "metrics" of the spray shape and burst quality were determined useful for quantifying the effect of inner air. They echo the fact that bursting becomes more dramatic with increasing inner air. CFD results correlate with one of the AWTS metrics.

Acknowledgments

The author greatly appreciates the support of a multitude of Eastman Chemical Company personnel. Specifically, Duane Brooker, Josh Earley, Paul Fanning, Glenn Shoaf, Molly Provost, Steve Hrivnak, and Dave Stevens were key contributors to this effort.

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2. Lienemann, H., Shrimpton, J., and Fernandes, E., 2007. A study of the aerodynamic instability of attenuating liquid sheets. *Exp. Fluids* 42, 241–258
3. Strasser, W., Brooker, D., Earley, J., and Fanning, P., 2010. CFD investigation of air-water test stand for three-steram airblast reactor feed injector, FEDSM 2010.
4. Strasser, W., 2010. Towards the optimization of a pulsatile three-stream coaxial airblast injector. *International Journal of Multiphase Flow*, 10.1016/j.ijmultiphaseflow.2011.01.011
5. Dumouchel, C., 2008. On the experimental investigation on primary atomization of liquid streams. *Exp Fluids* 45, 371–422. ■

IMECE2010

The IMECE2010 conference was held in the Vancouver Convention & Exposition Centre in Vancouver, British Columbia during November 12–18, 2010. The Fluids Engineering Division traditionally co-sponsors theFluid Flow, Heat Transfer and Thermal Systems Track 10 with the Heat Transfer Division, however in 2010, the Fluids Engineering Division was the sole sponsor. Several of our Fluids Engineering Division organizers put in extra effort to handle the heat transfer oriented papers traditionally organized by Heat Transfer Division. Special thanks go to Dr. S. A. Sherif for helping to reorganize technical papers and solicit organizers to volunteer for the dedicated work needed to make this a success. The list of topics, lead organizers and numbers of final papers are as follows:

- **10-1** 6th Forum on Recent Developments in Multi-Phase Flow, Malcolm Andrews, 21 papers.
- **10-2** 19th Symposium on Industrial Flows, Wayne Strasser, 28 papers.
- **10-3** Symposium on Fluid Applications and Clean Energy Systems, Upendra Rohatgi, 13 papers.
- **10-5** Symposium on Diagnostics in Thermo-Fluid Systems, F. Javier Diez, 4 papers.
- **10-6** 13th International Symposium on Measurement and Modeling of Environmental Flows, S.A. Sherif, 10 papers.
- **10-7** 11th Symposium on Advances in Materials Processing Science and Manufacturing, Dennis Siginer, 13 papers.
- **10-8** 8th Symposium on Electric, Magnetic and Thermal Phenomena in Micro and Nano-Scale Systems, Dennis Siginer, 10 papers.
- **10-9** 8th Symposium on Fundamental Issues and Perspectives in Fluid Mechanics, Francine Battaglia, 24 papers.
- **10-10** 17th Symposium on Fluid Mechanics and Rheology of Nonlinear Materials and Complex Fluids, Dennis Siginer, 17 papers.
- **10-11** Microfluidics 2010 Forum – Fluid Engineering in Micro- and Nanosystems, Peter Huang, 17 papers.
- **10-12** Forum on CFD Algorithms and Applications for Flow Optimization and Controls, Z. Charlie Zheng, 17 papers.
- **10-13** Young Engineer Paper (YEP) Contest Fluids Engineering Division, Terry Beck, 3 papers.
- **10-14** Two-Phase Flow: Boiling and Condensation, J.N. Chung, 7 papers.
- **10-15** Numerical and Experimental Heat Transfer, Keith Walters, 30 papers.
- **10-16** Opportunities in Energy Efficient Systems, M. H. Hosni, 2 papers.

IMECE2011 Track 11, Fluids & Thermal Systems

By Jinkook Lee, Ph.D., Secretary of FED, IMECE2011 FED Representative and Track 11 Chair, and FEDSM2012 Conference Chair

ASME 2011 International Mechanical Engineering Congress & Exhibition (IMECE2011) will be held at Hyatt Regency Hotel & Convention Center in Denver, Colorado from November 11 to November 17, 2011.

Total of fourteen topics are organized by FED for upcoming IMECE2011 and more than 300 abstracts are accepted as of March 31, 2011.

The list of topics, lead organizers, and numbers of accepted abstract are as follows:

- **11-1** Wind Turbines: Aerodynamics and Control, Prof. Jaikrishnan Kadambi, Case Western Reserve University, 14 Abstracts accepted.
- **11-2** 20th Symposium on Industrial Flows, Dr. Wayne Strasser, Eastman Chemical Company, 41 Abstracts accepted.
- **11-3** Forum on CFD Applications for Optimization and Controls, Prof. Z. Charlie Zheng, University of Kansas, 59 Abstracts accepted.
- **11-4** Microfluidics 2011: Fluid Engineering in Micro- and Nanosystems, Prof. Chang-Hwan Choi, Stevens Institute of Technology, 52 Abstracts accepted.
- **11-5** Noninvasive Measurements in Single and Multiphase Flows, Dr. Bahram Khalighi, General Motors R&D Center, 9 Abstracts accepted.
- **11-6** Fluid Measurements and Instrumentation, Ms. Judith Bamberger, Pacific Northwest National Laboratory, 31 Abstracts accepted.
- **11-7** 7th Forum on Recent Developments in Multiphase Flow, Dr. Malcolm Andrews, Los Alamos National laboratory, 29 Abstracts accepted.
- **11-8** 12th Symposium on Advances in Materials Processing Science and Manufacturing, Prof. Dennis Siginer, Petroleum Institute, U.A.E., 8 Abstracts accepted.
- **11-9** 9th Symposium on Electric, Magnetic & Thermal Phenomena in Micro and Nano-Scale Systems, Prof. Dennis Siginer, Petroleum Institute, U.A.E., 13 Abstracts accepted.
- **11-10** 18th Symposium on Fluid Mechanics and Rheology of Nonlinear Materials and Complex Fluids, Prof. Dennis Siginer, Petroleum Institute, U.A.E., 26 Abstracts accepted.
- **11-11** 10th Symposium on Fundamental Issues and Perspectives in Fluid Mechanics, Prof. Francine Battaglia, Virginia Polytechnic Institute and State University, 23 Abstracts accepted.
- **11-12** Panel on CFD/EFD (Experimental Fluid Dynamics) Choice – Dilemma for Industries.
- **11-13** Panel on Fluid Measurement Uncertainty.
- **11-14** Young Engineer Paper (YEP) Contest. ■

2012 Fluids Engineering Division Summer Meeting

Location and time: The 2012 Fluids Engineering Division Summer Meeting will be held as a Joint Conference with ASME Summer Heat Transfer Conference, the Fluids Engineering Division Summer Meeting, and the International Conference on Nanochannels, Microchannels and Minichannels at the **Wyndham Rio Mar Beach Resort** in **Puerto Rico** from **July 8 to July 12, 2012**.

Conference Description: This conference will bring together international researchers and engineers focusing on heat and mass transfer and fluid flow in a variety of applications. The objectives of the meeting are to provide a forum for presentation of state-of-art research and opportunities for technical interactions among participants.

Conference Topics: Contributions are being solicited on fundamental research and applications related to heat and mass transfer and fluid mechanics from large-scale to nano-scale. Conference topics include applications in the areas of energy systems, combustion, aerospace, gas turbines, electronic equipment, biotech, manufacturing, environment, multiphase flows, and nano-, micro-, and mini-channels. Theoretical, fundamental measurements, flow visualization, and computational heat transfer and fluid dynamics are also welcomed.

Website: http://www.asmeconferences.org/HTFNMM2012/