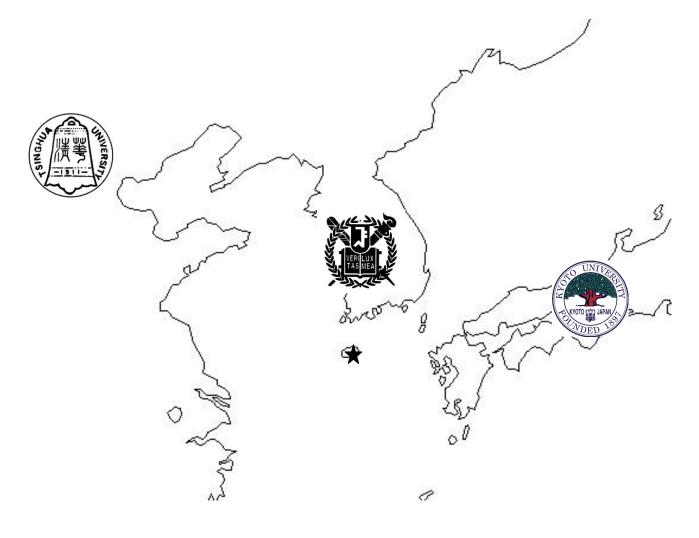
The Eleventh Seoul National - Kyoto - Tsinghua University Thermal Engineering Conference, 2011



November 2 - 4, 2011 Shineville Resort in Jeju Island, Korea

Conference Co-Chairpersons :

Lee, Joon Sik	Seoul National University
Makino, Toshiro	Kyoto University
Li, Zhi-Xin	Tsinghua University

Sponsored by

BK 21 School for Creative Engineering Design of Next Generation Mechanical and Aerospace Systems, SNU Micro Thermal System Research Center, SNU

Program

November 2, Wednesday, 2011

18:00 - 20:00 Reception, Shineville Resort

November 3, Thursday, 2011

- 09:00 09:15 **Registration**
- 09:15 09:30 **Opening & Introduction**

09:30 - 10:50 Session 1 Heat Transfer: Chair/ Prof. Seung Jin Song

< Break >

11:10 - 12:10 Session 2 Fluid Engineering: Chair/ Prof. David Christopher

<Lunch>

13:30 - 15:20 Session 3 Thermal Engineering: Chair/ Prof. Kazuya Tatsumi

< Break >

15:40 - 17:00 Session 4 Energy: Chair/ Prof. Charn-Jung Kim

< Free Time >

18:00 - 20:00 Conference Banquet

Program

November 4, Friday, 2011

09:00 - 10:20 Session 5 Combustion and Engine: Chair/ Prof. Xingang Liang

< Break >

10:40 - 11:40 Session 6 Nanotechnology and Measurement: Chair/ Prof. Hiroshi Iwai

11:40 - 11:50 Closing & Announcements

14:00 - 18:00 Industrial Tour

List of Participants from Seoul National University

Seoul 151-742, Korea

Choi, Mansoo (崔萬秀), Professor School of Mechanical and Aerospace Engineering Phone: +82-2-880-7128, Fax: +82-2-883-0179 E-mail: mchoi@snu.ac.kr Kim, Charn Jung (金燦中), Professor School of Mechanical and Aerospace Engineering Phone: +82-2-880-1662, Fax: +82-2-883-0179 E-mail: kimcj@snu.ac.kr Lee, Joon Sik (李俊植), Professor School of Mechanical and Aerospace Engineering Phone: +82-2-880-7117, Fax: +82-2-883-0179 E-mail: jslee123@snu.ac.kr Lee, Jung Hoon (李廷勳), Professor School of Mechanical and Aerospace Engineering Phone: +82-2-880-9104, Fax: +82-2-883-0179 E-mail: jleenano@snu.ac.kr Min, Kyoung Doug (閔庚德), Professor School of Mechanical and Aerospace Engineering Phone: +82-2-880-1661, Fax: +82-2-883-0179 E-mail: kdmin@snu.ac.kr Oh, Hyuck Keun (吳爀根), Ph.D. Student School of Mechanical and Aerospace Engineering Phone: +82-2-880-7123, Fax: +82-2-883-0179 E-mail: deedleet@snu.ac.kr Song, Han Ho (宋漢虎), Assistant Professor School of Mechanical and Aerospace Engineering Phone: +82-2-880-1651, Fax: +82-2-883-0179 E-mail: hhsong@snu.ac.kr Song, Seung Jin (宋晟湊), Professor School of Mechanical and Aerospace Engineering Phone: +82-2-880-1667, Fax: +82-2-883-0179 E-mail: sjsong@snu.ac.kr Suh, Kahp Yang (徐甲亮), Associate Professor School of Mechanical and Aerospace Engineering Phone: +82-2-880-9103, Fax: +82-2-883-0179 E-mail: sky4u@snu.ac.kr

List of Participants from Kyoto University

Kyoto 606-8501, Japan

Hanazaki, Hideshi (花崎秀史), Professor Department of Mechanical Engineering and Science Phone/Fax: +81-75-753-4825 E-mail: hanazaki.hideshi.5w@kyoto-u.ac.jp Iwai, Hiroshi (岩井裕), Associate Professor Department of Aeronautics and Astronautics Phone: +81-75-753-5218, Fax: +81-75-753-5203 E-mail: iwai.hiroshi.4x@kyoto-u.ac.jp Kawara, Zensaku (河原全作), Lecturer Department of Nuclear Engineering Phone/Fax: +81-75-753-5842 E-mail: kawara@nucleng.kyoto-u.ac.jp Kishimoto, Masashi (岸本将史), PhD candidate Department of Aeronautics and Astronautics Phone/Fax: +81-75-753-5203 E-mail: blauer-vogel@t04.mbox.media.kyoto-u.ac.jp Kitano, Tomoaki (北野智朗), MC student Department of Mechanical Engineering and Science Phone/Fax: +81-75-075-753-5245 E-mail: kitano.tomoaki@fx3.ecs.kyoto-u.ac.jp Kurose, Ryoichi (黒瀬良一), Associate Professor Department of Mechanical Engineering and Science Phone/Fax: +81-75-753-9218 E-mail: kurose@mech.kyoto-u.ac.jp Makino, Toshiro (牧野俊郎), Professor Department of Mechanical Engineering and Science Phone: +81-75-753-5265, Fax: +81-75-771-7286 E-mail: makino.toshiro.2a@kyoto-u.ac.jp Nakabe, Kazuyoshi (中部主敬), Professor Department of Mechanical Engineering and Science, Phone: +81-75-753-5210. Fax: +81-75-753-5209 E-mail: nakabe@me.kyoto-u.ac.jp Rai, Yasuhiro (頼泰弘), PhD candidate Department of Mechanical Engineering and Science, Phone/Fax: +81-75-753-5209 E-mail: y-rai@t03.mbox.media.kyoto-u.ac.jp

Saito, Motohiro (齋藤元浩), Assistant Professor Department of Aeronautics and Astronautics Phone/Fax: +81-75-753-5203 E-mail: msaito@mech.kyoto-u.ac.jp Tatsumi, Kazuya (巽和也), Associate Professor Department of Mechanical Engineering and Science Phone: +81-75-753-5224, Fax: +81-75-753-5209 E-mail: tatsumi@me.kyoto-u.ac.jp Yoshida, Hideo (吉田英生), Professor Department of Aeronautics and Astronautics Phone/Fax: +81-75-753-5255 E-mail: sakura@hideoyoshida.com

List of Participants from Tsinghua University

Beijing 100084, China

Chen, Qun (陈群), Lecturer
School of Aerospace
Phone & Fax: +86-10-62781610
E-mail: chenqun@tsinghua.edu.cn
Christopher, David M. (柯道友), Professor
Department of Thermal Engineering
Phone: + 86-10-62772986, Fax: +86-10-62770209
E-mail: dmc@mail.tsinghua.edu.cn
Li, Zhi-Xin (李志信), Professor
School of Aerospace
Phone & Fax: +86-10-62772919
E-mail: lizhx@tsinghua.edu.cn
Liang, Xin-Gang (梁新刚), Professor
School of Aerospace
Phone & Fax: +86-10-62788702
E-mail: liangxg@tsinghua.edu.cn
Liu, Xiaohua (刘晓华), Associate Professor
Department of Building Science
Phone: +86-10-6277-4772; Fax: +86-10-6277-0544
E-mail: lxh@tsinghua.edu.cn
Wang, Moran (王沫然), Professor
School of Aerospace
Phone & Fax: +86-10-62792398
E-mail: mrwang@tsinghua.edu.cn
Yang, Zhen (杨震), Associate Professor
Department of Thermal Engineering
Phone & Fax: + 86-10- 62789751
E-mail: zhenyang@mail.tsinghua.edu.cn







Contents

Session 1 / Heat Transfer

An MD-like simulation on mechanism of coherency of emitted thermal radiation – an incomplete report – 1 Toshiro Makino*, Tatsuya Uno, Hidenobu Wakabayashi, Mitsuhiro Matsumoto
Microbubble nucleation and dynamics during flow boiling over a microheater with pulse heating
Flow and heat transfer characteristics of viscoelastic fluid flow in serpentine channels
Electronic structures of carbon nanotubes associated with biological interactions
Session 2 / Fluid Engineering
Study on liquid film flow along first wall of laser fusion reactor
Effects of surface roughness and pressure gradient on turbulent boundary layers
Unsteady aspects of a jet generated by a sphere descending in stratified fluids
Session 3 / Thermal Engineering
Simulation of melting heat transfer in metal foams
Application of M#Math to thermal engineering
Thermal rectification and phonon scattering in asymmetric silicon nanoribbons
Three-dimensional simulation of SOFC anode polarization characteristics based on sub-grid scale modeling of microstructure

Masashi Kishimoto*, Hiroshi Iwai, Motohiro Saito, Hideo Yoshida

Contents

Session 4 / Energy

Numerical study on flow and heat transfer performance of power plant condenser
Multiscale mechanical interlocking for sensor applications
An entransy dissipation-based optimization principle for building central chilled water systems
Application of entransy in indoor built environment
Session 5 / Combustion and Engine
Experimental study on a compact methanol-fueled reformer using ceramic honeycomb
Study on the effects of the in-cylinder EGR stratification on NOx and soot emissions in diesel engines 103 Kyoungdoug Min*, Wonah Park, Sangyul Lee
Analysis and flamelet modeling for spray combustion in high ambient pressure condition 113 Tomoaki Kitano*, Ryoichi Kurose, Satoru Komori
Development of an MCFC-HCCI engine hybrid system for power generation
Session 6 / Nanotechnology and Measurement
Ion assisted aerosol lithography (IAAL) for nanoparticle assembly

Hoseop Choi, Heechul Lee, Chang Gyu Woo, Kyuhee Han, Peter Pikhitsa, Mansoo Choi*
Correlations between microstructure and effective properties of multiphase porous materials
A novel method for LED efficiency measurement

Author Index

Abid, Agha Raza ······ 119
Ahn, Kook Young 119
Chen, Qun77
Choi, Hoseop 123
Choi, Mansoo 123
Christopher, David M9
Duan, Yuanyuan43
Gong, Wei 43
Han, Kyuhee 123
Hanazaki, Hideshi39
Heong, Chee Leong
Iwai, Hiroshi 55
Jang, Jae Jun
Ju, Sheng-Hong ·····49
Jung, Seungwon23
Kang, Daeshik71
Kang, Sang Gyu 119
Kawara, Zensaku
Kim, Charn-Jung47
Kishimoto, Masashi55
Kitano, Tomoaki ····· 113
Kogame, Hideyuki ······97
Komori, Satoru 113
Kunugi, Tomoaki29
Kurose, Ryoichi ····· 113
Lee, Heechul 123
Lee, Joon Sik 145
Lee, Junghoon ······23
Lee, Sangyul····· 103
Lee, Young Duk ······ 119
Li, Quan Yang 9
Li, Zhi-Xin·····63