

Final Program

2006 KSAS-JSASS Joint International Symposium on Aerospace Engineering

November 15-17, 2006
Paradise Hotel, Busan, Korea



The Korean Society for Aeronautical and Space Sciences (KSAS)

The Japan Society for Aeronautical and Space Sciences (JSASS)

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Sponsors

We wish to thank the followings for their contribution to the success of this conference:

- US Air Force Office of Scientific Research (AFOSR), Asian Office of Aerospace Research and Development (AOARD)
- The Korean Federation of Science and Technology Societies (KOFST)
- Korea Aerospace Industries (KAI)
- Busan Convention and Visitors Bureau

Symposium at a Glance

Date	Time	Activities	Place
Nov. 15	18:30 - 21:00	Welcome Party	Korean Restaurant "YEIJE" (see MAP)
Nov. 16	08:30 - 12:00	Registration	Hotel Main Bldg. 2nd Floor
	09:00 - 11:00	Technical Sessions	Hotel Main Bldg. 2nd Floor
	11:10 - 12:10	Plenary Lectures	Hotel Main Bldg. 2nd Floor Grand Ballroom
	12:10 - 13:40	Lunch (free with ticket)	To be Announced
	13:40 - 15:40	Technical Sessions	Hotel Main Bldg. 2nd Floor
	15:50 - 17:20	Invited Lectures	Hotel Main Bldg. 2nd Floor Room Capri
	17:20 - 18:30	Cocktail Break	Hotel Main Bldg. 2nd Floor Room Sydney
Nov. 17	18:30 - 21:00	Dinner (free with ticket)	Hotel Main Bldg. 2nd Floor Grand Ballroom
	08:30 - 18:00	Technical Tour (KAI)	Hotel Parking Lot

Registration

Early registration is not required. Just visit the registration desk for international participants (Main bldg. 2nd floor)

The registration fee is as follows:

Class	General	Students
Members (KSAS or JSASS)	100,000 KRW	50,000 KRW
Non-members	120,000 KRW	60,000 KRW

The fee includes the proceedings, the lunch meal of November 16, and the banquet of November 16.

The registration fee is payable in cash or by credit card. When paid by foreign currency, the fixed exchange rates of 1,000 KRW = 130 JPY = 1.1 USD are applied.

Welcome Party

The participants from overseas are invited to the welcome party sponsored by Korea Aerospace Industries Association (KAIA). It will be held on November 15, 6:30 PM, at YEIJE (a Korean-style restaurant) located nearby the hotel parking lot. (see map)

Technical Tour

A full-day technical tour to Korea Aerospace Industries (KAI) located in Sacheon is scheduled on November 17 for the overseas participants of the Joint International Symposium. Sponsored by KAI, The technical tour is free of cost. The bus leaves at 8:30 AM at the parking lot between the hotel buildings and returns to the hotel before 18:00 PM.

Because of the security reason, pre-registration is required for the technical tour.



The Hotel Paradise and Vicinity

Symposium Schedule (November 16, 2006)

TIME		ROOMS						
FROM	TO	Grand Ballroom	Capri	Napoli	Venice	Miami	Sydney 1	Sydney 2
		Session S1	Session A1	Session B1	Session C1	Session D1	Session E1	Session F1
09:00	09:20							
09:20	09:40		UAV Technology 1	Aerodynamics, Design and CFD 1	Combustion and Experimental Study 1	Control and Application 1	Guidance, Navigation and Sensor 1	Structure and Material 1
09:40	10:00							
10:00	10:20							
10:20	10:40							
10:40	11:00							
11:00	11:10	Break						
11:10	11:40	Plenary 1						
11:40	12:10	Plenary 2						
12:10	13:40	LUNCH						
		Session A2	Session B2	Session C2	Session D2	Session E2	Session F2	
13:40	14:00		UAV Technology 2	Aerodynamics, Design and CFD 2	Combustion and Experimental Study 2	Control and Application 2	Guidance, Navigation and Sensor 2	Structure and Material 2
14:00	14:20							
14:20	14:40							
14:40	15:00							
15:00	15:20							
15:20	15:40							
15:40	15:50	Break						
		Session S2						
15:50	16:20	Invited 1						
16:20	16:50	Invited 2						
16:50	17:20	Invited 3						
17:20	18:30						Cocktail Break	
18:30	21:00	DINNER						

Table of Contents

Session S1: Plenary Lectures (Grand Ballroom)

Chair: Prof. Myung-Hwan Sohn (Korea Air Force Academy)

- 11:10 Japanese Aerospace Industries**
Mr. Toshikazu Miyabe (The Society of Japanese Aerospace Companies)
- 11:40 Recent Development of Structural Health Monitoring of Aerospace Composite Structures Using Optical Fiber Sensors**
Prof. Nabuo Takeda (The University of Tokyo)

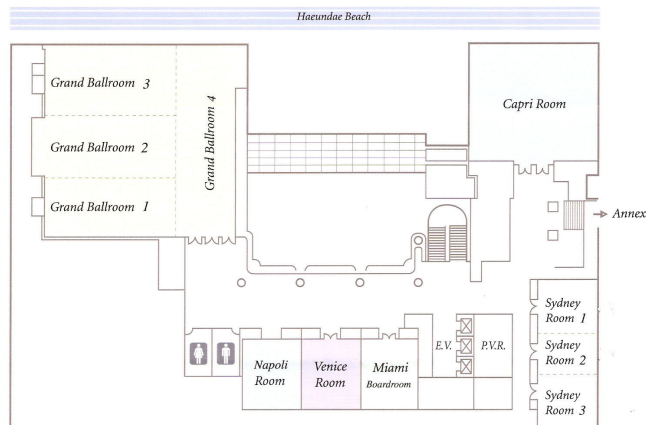
Session S2: Invited Lectures (Room Capri)

*Chairs: Prof. Jong-Soo Choi (Chungnam National University)
Mr. Masayuki Kubo (Kawasaki Heavy Industries)*

- 15:50 KOMPSAT-2 Launch Success and Future Satellite Development Plan in Korea**
Dr. Joo-Jin Lee (Korea Aerospace Research Institute)
- 16:20 JAXA's Supersonic Program and the Future**
Dr. Kimio Sakata (Japan Aerospace Exploration Agency)
- 16:50 Introduction to KAI's Aircraft Business Focusing on KHP Program**
Dr. Jun Ho Yang (Korea Aerospace Industries)

Room Arrangement

2F Main Build.



Session A1: UAV Technology 1 (Room Capri)

*Chairs: Prof. NakWan Kim (Chungnam National Univ.)
Prof. Koichi Yonemoto (Kyusyu Inst. of Tech.)*

- 09:00 **Navigation, Guidance and Control of Parafoil Recovery System for KIT' Experimental Rocket**
Takashi Yatoh, Yu Hiroki, Itaru Shida, Shinichi Sagara, Koichi Yonemoto (Kyushu Institute of Technology)
- 09:20 **First Exploitation of Responsive Space in Korea by Ultra-Small Satellite Development**
Young-Keun Chang, Byoung-Young Moon, Byung-Hun Lee, Suk-Jin Kang (Hankuk Aviation Univ.)
- 09:40 **Trajectory Guidance and Control for a Small UAV**
Youichi Satou, Takeshi Yamasaki, Hiroyuki Takano, Yoriaki Baba (Nat. Defense Academy)
- 10:00 **An Autonomous Flight for Unmanned Indoor Airship by Line Following**
Masahito Kawade, Shinji Suzuki (Univ. of Tokyo)
- 10:20 **Preliminary Design of Small Coaxial Unmanned Aerial Vehicle**
Young-Seop Byun, Byoung-Eon Lee, Jun-Beom Song, Jeong Kim, Beom-Soo Kang (Pusan Nat. Univ.)
- 10:40 **Transitional Flights Analysis of Small Tail-Sitter VTOL UAV**
Daisuke Kubo, Shinji Suzuki (Univ. of Tokyo)

Session A2: UAV Technology 2 (Room Capri)

*Chairs: Prof. Youdan Kim (Seoul Nat. Univ.)
Dr. Takeshi Tsuchiya (Univ. of Tokyo)*

- 13:40 **Optimal Reconfiguration of Unmanned-Aerial-Vehicle Formation Without Collision**
Soon Jae Kwon, Seiya Ueno (Yokohama Nat. Univ.)
- 14:00 **Formation Flight Controller Design Minimizing the Difference of UAVs Fuel Consumption**
Jongug Choi, Gwanyoung Moon, Youdan Kim (Seoul Nat. Univ.)
- 14:20 **Waypoint Tracking of UAV Using Feedback Error Learning**
Akiko Matsuura, Ryota Haga, Shinji Suzuki (Univ. of Tokyo)
- 14:40 **OBK-Sky Eye3 Small UAV and Its Application for Nature Restoration**
Akinbosoye Temitope Tosin, Kubo Daisuke, Suzuki Shinji, Yuba Norio (Univ. of Tokyo)
- 15:00 **Guidance and Control for Leader-Follower Formation Flight of Two UAV's**
Tae Soo No (Chonbuk Nat. Univ.), Youdan Kim (Seoul Nat. Univ.), Min-Jea Tahk (KAIST)
- 15:20 **Development of Special-Purpose Flight Simulator for Human-Powered Aircraft**
Yasuhiro Inaba, Yuzo Shimada, Kenji Uchiyama, Kenichi Abe, Akio Abe, Chikatoshi Satoh, Shohei Onishi (Nihon Univ.)

Session B1: Aerodynamics, Design and CFD 1 (Room Napoli)

*Chairs: Prof. Byoungsoo Kim (Chungnam Nat. Univ.)
Mr. Tomoka Tsujiuchi (Kawasaki Heavy Industries)*

- 09:00 **Leading-Edge Morphing of Laminar Airfoil to Reduce Drag at Off-Design Angle of Attack**
Kenichi Rinoie, Hiroharu Suzuki, Asei Tezuka (Univ. of Tokyo)
- 09:20 **Implicit Large Eddy Simulation of Turbulent Channel Flow Using AUSM Scheme**
Bum-Yong Koh, Seung-O Park (KAIST)
- 09:40 **A Study of Pointwise Relaxation Computation Using Discontinuous Galerkin Method for Viscous Compressible Flowfield**
Kanako Yasue, Naofumi Ohnishi, Keisuke Sawada (Tohoku Univ.)
- 10:00 **Energy Separation Phenomenon near the Boundray Layer Flow**
M. S. Yu, H. H. Cho (Yonsei Univ.)
- 10:20 **Numerical Study of Airfoil Trailing-Edge Flows at Relatively Low Reynolds Numbers**
Yuta Sakurai, Takashi Ishida, Kazuhiro Nakahashi (Tohoku Univ.)
- 10:40 **Automatic Generation of Unstructured Hexahedral Grids for General 3D Regions**
Byoungsoo Kim (Chungnam Nat. Univ.), Chang-Soo Ahn (Agency for Defense Development)

Session B2: Aerodynamics, Design and CFD 2 (Room Napoli)

*Chairs: Prof. Chongam Kim (Seoul Nat. Univ.)
Prof. Kenichi Rinoie (Univ. of Tokyo)*

- 13:40 **Steady Aerodynamic Characteristics of a Future Air-Speed Transit Flying over the Nonplanar Ground Surface**
Jeong-Hyun Cho, Yong-In Joung, Yeon-Woo Cho, Jin-Soo Cho (Hanyang Univ.)
- 14:00 **Application of MDO Technology to Jet Aircraft Design**
Hiroyuki Tanaka, Keita Hatanaka (Mitsubishi Heavy Industries), Shigeru Obayashi, Shinkyu Jeong (Tohoku Univ.)
- 14:20 **A Numerical Study of Thrust and Lift Generation Mechanism on 2-Dimensional Insect Wing**
Jung-Sang Lee, Jin-ho Kim, Chongam Kim (Seoul Nat. Univ.)
- 14:40 **Study of an Ornthoptic Micro Aerial Vehicle with Flapping and Feathering Wing Motions**
Jonathan Maglasang, Norihiro Goto (Kyushu Univ.), Koji Isogai (Nippon Bunri Univ.)
- 15:00 **Toward a More Complete Analysis for Fluid-Structure Interaction in Helicopters**
KyungHwan Kim, SangJoon Shin (Seoul Nat. Univ.), Jaewon Lee, Kwanjung Yee, Sejong Oh (Pusan Nat. Univ.)
- 15:20 **Aerodynamic Optimization of a High-Lift System**
Daisuke Hirayama, Keizo Takenaka, Hyoung-Jin Kim, Kisa Matsushima, Kazuhiro Nakahashi (Tohoku Univ.)

Session C1: Combustion and Experimental Study 1 (Room Venice)

*Chairs: Prof. Seong-Man Choi (Chonbuk Nat. Univ.)
Dr. Shigeru Hamamoto (JAXA)*

- 09:00 **An Experimental Study of the Diffusion Flame Characteristics for the Gas Fueled Torch System**
Hyun-Kyung Choi, Seong-Man Choi (Chonbuk Nat. Univ.)
- 09:20 **Development of Turbojet Engine for Supersonic Unmanned Plane**
Ryojiro Minato, Nobuhiro Tahatsugu, Kazuhide Mizobata (Muroran Inst. of Tech.), Toyohiko Ota, Kiyoshi Fukutomi (Advanced Science & Intelligence Research Inst.), Takayuki Kojima, Hiroaki Kobayashi (JAXA)
- 09:40 **Heat Flux Measurement in Supersonic Internal Flows**
M. S. Yu (Yeonsei Univ.), K. Kudo, A. Murakami, K. Kato, K.Tani, T. Kanda (JAXA)
- 10:00 **CFD Pressure Estimation Using PIV Data**
Tomohiro Aso, Kisa Matsushima, Kazuhiro Nakahashi (Tohoku Univ.)
- 10:20 **Installed Performance Analysis of a Turbo-Shaft Engine Considering Inlet and Exhaust Losses Estimated by CFD Technique**
Chang Duk Kong, George Omollo (Chosun Univ.)
- 10:40 **Development Study on a Small-scale Supersonic Flight Experiment Vehicle with Jet Propulsion in Cooperation between Universities**
Kazuhide Mizobata, Ryojiro Minato, Nobuhiro Tanatsugu, Hiroyuki Kimura, Syota Hada, Maya Kudo (Muroran Inst. of Tech.), Takehiro Himeno, Hiroaki Kobayashi (Univ. Tokyo), Hiroaki Kobayashi, Takayuki Kojima (JAXA), Sigeru Aso, Yasuhiro Tani (Kyushu Univ.), Takakage Arai (Osaka Prefecture Univ.)

Session C2: Combustion and Experimental Study 2 (Room Venice)

*Chairs: Prof. Soo-Yong Cho (Gyeongsang Nat. Univ.)
Dr. Ryojiro Minato (Muroran Inst. of Tech.)*

- 13:40 **Demonstration of Aerodynamic Design Technologies on Supersonic Experimental Airplane (NEXST-1) by Flight Test**
Dong-Youn Kwak, Naoko Tokugawa, Kenji Yoshida (JAXA)
- 14:00 **Effect of Low Partial Admission Rate on a Small-Scale Axial-Type Turbine**
Chong-Hyun Cho, Bong-Soo Cho (Gyeongsang Nat. Univ.), Chaesil Kim (Changwon Nat. Univ.), Soo-Yong Cho (Gyeongsang Nat. Univ.)
- 14:20 **Flow Analysis and Optimization of Vertical Axis Wind-Turbine**
Ichie Monjugawa, Shun Takahashi, Kazuhiro Nakahashi (Tohoku Univ.)
- 14:40 **The Study of the Burning Properties of the Model Hydro Reactive Solid Propellant**
Ju-hyen Sim, Seung-vin Lim, Jae-ou Chae, Seung-lyul Kim (Inha Univ.)
- 15:00 **A Conception of High Reynolds Number Wind Tunnels**
Shigeru Hamamoto (Japan Aerospace Exploration Agency)
- 15:20 **Flight Path Estimation using Acoustic Signal and TDOA Algorithm**
Wook Rhee, Jong-Soo Choi (Chungnam Nat. Univ.)

Session D1: Control and Application 1 (Room Miami)

*Chairs: Prof. Hyounjin Kim (Seoul Nat. Univ.)
Prof. Yasuhiro Osa (Kobe City College)*

- 09:00 **Automatic Control for Chase Aircraft**
Takeshi Yamasaki, Keisuke Enomoto, Daiki Tanaka, Hiroyuki Takano, Yoriaki Baba (National Defense Academy)
- 09:20 **Real Flight Analysis of Pilot Control Using Neural Network**
Ryota Mori, Shinji Suzuki (Univ. of Tokyo)
- 09:40 **Adaptive Sliding Mode Control Design for Input Non-affine Nonlinear System**
Chaeik Ahn, Hyounjseok Kim, Youdan Kim, Hyounjin Kim (Seoul Nat. Univ.)
- 10:00 **Aeroassisted Powered Descent Guidance for Vehicles with Low Lift-to-Drag Ratio**
Takahiro Ogawa, Kenji Uchiyama, Yuza Shimada (Nihon Univ.)
- 10:20 **Design of Nonparametric Adaptive Flight Controller for Automatic Landing Using Dynamic Inversion and Disturbance-Accommodation-Control Observer**
Daisaku Higashi, Yuza Shimada, Kenji Uchiyama (Nihon Univ.), Shinji Ishimoto, Yoshinori Minami (JAXA)
- 10:40 **A Hybrid Algorithm for Conflict Resolution of Multiple Aircraft**
Yeonju Eun, Hyochoong Bang (KAIST)

Session D2: Control and Application 2 (Room Miami)

*Chairs: Prof. Hyochoong Bang (KAIST)
Mr. Takasi Kohno (JAXA)*

- 13:40 **A Simple Control Law of Tether Deployment on Tether Satellite.**
Takafumi Imazu, Yosuke Tanaka, Hiroshi Hirayama, Toshiya Hanada (Kyushu Univ.)
- 14:00 **Longitudinal Control for Hovering Flight of Small Flapping-Wing Vehicle**
Takahiro Inoue, Takeshi Tsuchiya (Univ. of Tokyo)
- 14:20 **Rapid Initial Detumbling Strategy for Micro/Nano satellite with Pitch Bias Momentum System**
Young-Keun Chang, Byung-Hoon Lee, Jung-Won Choi, Mi-Yeon Yun, Seok-Jin Kang, Byoung-Young Moon (Hankuk Aviation Univ.)
- 14:40 **Dynamic Characteristic of 2-Dimensional Parachute-like Body with Consideration of Virtual Mass**
Hiroyuki Houzu, Norio Arai, Yoko Takakura (Tokyo Noko Univ.)
- 15:00 **Synthesis of Robust Nonlinear Model Matching Flight Control System Against Deterministic Disturbance**
Yasuhiro Osa (Kobe City College), Shigeru Uchikado (Tokyo Denki Univ.)
- 15:20 **Fault Tolerant Attitude Control for a Satellite Using Time Delay Control**
Jaehyun Jin (Suncheon Nat. Univ.)

Session E1: Guidance, Navigation and Sensor 1 (Room Sydney 1)

*Chairs: Prof. Keeyoung Choi (Inha Univ.)
Prof. Yoshimasa Ochi (National Defense Academy)*

- 09:00 **Performance Improvement of Low-Cost INS/GPS with Sun Line of Sight**
Keeyoung Choi, Se-ah Jang (Inha Univ.)
- 09:20 **Multi-Sensor Fusion Algorithm Based on Federated Kalman Filter for Real Time Target Tracking System**
Jong-Hwa Song, Sun-Jun Ko, Young-Jae Lee, Ja-Sung Lee (Ajou Univ.)
- 09:40 **A Portable and Cost-Effective Configuration of Strap-down INS/GPS for General-Purpose Use**
Masaru Naruoka, Takeshi Tsuchiya (Univ. of Tokyo)
- 10:00 **Safety Assurance Procedure for Modifications to Flight Control Computer Software**
Ko Joon Soo, Lim Sang Soo, Ahn Jong Min (Agency for Defense Development Korea), Purl Duncan (Aquinas England)
- 10:20 **An Efficient Search Method for Fast Fine Frequency Acquisition**
Jean-Baptiste CEBE (KAIST), Youngsu Cho (ETRI)
- 10:40 **Three Dimensional Emergency Guidance Law of Future Space Transportation System**
Seiya Ueno (Yokohama Nat. Univ.), Shinji Ishimoto (JAXA)

Session E2: Guidance, Navigation and Sensor 2 (Room Sydney 1)

*Chairs: Prof. Dae Woo Lee (Pusan Nat. Univ.)
Prof. Seiya Ueno (Yokohama Nat. Univ.)*

- 13:40 **Accuracy Performance Evaluation for both MSAS and NDGPS-Preliminary Results**
Jong-Chol Kim, Kyung-Ryoon Oh, Jae-Hoon Song (KARI)
- 14:00 **Study on the New Guidance Law Using the Distance Information Based on Nonlinear Input Non-affine Control System**
Gwanyoung Moon, Youdan Kim (Seoul Nat. Univ.)
- 14:20 **Automatic Aerial Refueling for a CCV Aircraft**
Yoshimasa Ochi (National Defense Academy)
- 14:40 **Multi-Filter Fusion Technique for Nonlinear Systems and Its Application to the INS/GPS Loosely Coupled System**
Seong Yun Cho, Byung Doo Kim, Young Su Cho, Wan Sik Choi (ETRI)
- 15:00 **A Guidance Law Based on Pursuit-Evasion Game Solutions**
Young-Sam Kim, Min-Jea Tahk (KAIST), Hyeok Ryu (KARI)
- 15:20 **Optimization of the Post-Stall Maneuver of the Aircraft with the Thrust Vectoring Control**
Hidesuke Wada, Hiroyuki Takano, Takeshi Yamasaki, Yoriaki Baba (National Defense Academy)

Session F1: Structure and Material 1 (Room Sydney 2)

*Chairs: Prof. Jae-Hung Han (KAIST),
Mr. Takafumi Adachi (Fuji Heavy Industries)*

- 09:00 **Prevention of Wrinkling Development in the Inflatable Boom Structure**
Eun-Jung Yoo, Jin-Ho Roh, Jae-Hung Han (KAIST)
- 09:20 **Wing Flutter Suppression Using Piezoelectric Switching Control**
Kanjiro Makihara, Junjiro Onoda, Kenji Minesugi (ISAS, JAXA)
- 09:40 **Parallel Procedure and Performance of Two-Step Eulerian Scheme**
Seung Hoon Paik, Seung Jo Kim (Seoul Nat. Univ.), M Lee (Sejong Univ.)
- 10:00 **Development of High Strength Aluminum Alloy 2013 Extrusion for Low Cost Aircraft Structures**
Hideo Sano, Tadashi Minoda, Katsuya Kato (Sumitomo Light Metal Industries), Kenichi Kamimuki, Etsuko Noguchi (Kawasaki Heavy Industries)
- 10:20 **Post-Buckling Behaviors of Functionally Graded Panels Subjected to Combined Thermal and Aerodynamic Load**
Ki-Ju Sohn, Ji-Hwan Kim (Seoul Nat. Univ.)
- 10:40 **Study of Fatigue Improvement by Laser Peening for Aircraft Structure Parts**
Takafumi Adachi, Masakazu Shimanuki, Hiroshi Taguchi (Fuji Heavy Industries), Yuji Sano (Toshiba Corporation)

Session F2: Structure and Material 2 (Room Sydney 2)

*Chairs: Prof. Dong-Hyun Kim (Gyeongsang Nat. Univ.)
Ms. Etsuko Noguchi (Kawasaki Heavy Industries)*

- 13:40 **Fluid-Structure Simulation for Cascades with Stator-Rotor Interaction and Flow Viscosity Effect**
Dong-Hyun Kim, Se-Won Oh (Gyeongsang Nat. Univ.)
- 14:00 **Comparison of Applicability in Membrane Wrinkling Analysis Between Tension Field Theory and Bifurcation Buckling Theory**
Munetaka Kashiwa (Univ. of Tokyo), Junjiro Onoda (JAXA)
- 14:20 **Experimental Observations of Strain-Rate Effects on the Fracture Behavior of Unidirectional Composite Laminates Using a Shearing Interferometry**
Dongyeon Lee, Hareesh Tippur (Auburn Univ., U.S.A.)
- 14:40 **Effect of Temperature on Elastic and Piezoelectric Constants of PZT**
Noriyuki Tanaka (Nagoya Univ.), Hirokazu Yoshida (Mitsubishi Heavy Industries), Tadashige Ikeda, Tetsuhiko Ueda (Nagoya Univ.)
- 15:00 **Efficient Aeroelastic Analysis of Horizontal and Vertical Tails Using the Multi-Block Method in the Transonic Regime**
Jong-Yun Kim, Kyung-Seok Kim (KAIST), Hyuk-Jun Kwon (ADD), In Lee (KAIST)