



# Integration 2012



## 5th Symposium on Integrating CFD and Experiments in Aerodynamics

3rd to 5th October, 2012  
JAXA Chofu Aerospace Center, Tokyo, JAPAN



### Technical Session Program

#### Wednesday, October 3, 2012

8:30-16:00	<b>Registration</b>
9:30	<b>Opening Ceremony</b>
9:45	<b>Invited Lecture 1</b> chaired by Kenji Yoshida (JAXA, Japan) <b>IL1, EFD/CFD for MRJ Development</b> Ichiro Maeda, Keita Hatanaka (Mitsubishi Aircraft Co., Japan)
	<b>Session 1: Digital/Analog-Hybrid Wind Tunnel (DAHWIN) chaired by Kenji Yoshida (JAXA, Japan)</b>
10:30	<b>1-1, DAHWIN - Digital/Analog-Hybrid Wind Tunnel</b> Shigeya Watanabe, Shigeru Kuchi-Ishi, Keiichi Murakami, Atsushi Hashimoto, Hiroyuki Kato, Tatsuya Yamashita, Kanako Yasue, Kentaro Imagawa (JAXA, Japan), Hideji Saiki, Jun Ogino (Ryoyu Systems Co., Ltd., Japan)
11:00	<b>1-2, Development of Digital Wind Tunnel as a Subsystem of JAXA Digital/Analog Hybrid Wind Tunnel</b> Keiichi Murakami, Atsushi Hashimoto (JAXA, Japan), Manabu Hishida (Ryoyu Systems Co., Ltd., Japan), Paulus R. Lahur (Research Center of Computational Mechanics, Inc., Japan), Akira Kunieda (CEC Ltd., Japan), Shigeya Watanabe (JAXA, Japan)
11:30	<b>Poster Presentations chaired by Kenji Yoshida (JAXA, Japan)</b>
12:00	<b>Lunch &amp; Poster Session</b>
14:00	<b>Invited Lecture 2</b> chaired by Shigeru Obayashi (Tohoku University, Japan) <b>IL2, Bayesian Data Assimilation with Applications in Aerodynamics</b> Richard Dwight (Delft University of Technology, Netherlands)
	<b>Session 2: Data Assimilation-1 chaired by Shigeru Obayashi (Tohoku University, Japan)</b>
14:45	<b>2-1, Using Proper Orthogonal Decomposition Methods for Comparing CFD Results to Experimental Measurements</b> Thomas Andrienne, Amandine Guissart, Greg Dimitriadis, Vincent Terrapon (University of Liege, Belgium)
15:15	<b>Coffee Break</b>
	<b>Session 3: Wind Tunnel Application chaired by Shigeya Watanabe (JAXA, Japan)</b>
15:45	<b>3-1, An Experience of Using Numerical Methods in Experimental Investigations of TsAGI</b> S. L. Chernyshev, V. Ya. Neyland, S. M. Bosnyakov, S. A. Glazkov, A. R. Gorbushin, I. A. Kursakov, V. V. Vlasenko (TsAGI, Russian Federation)
16:15	<b>3-2, A Methodology to Derive Wind Tunnel Wall Corrections with RANS Simulations</b> Jean-Luc Hantrais-Gervois, Jean-François Piat (ONERA, France)
16:45	<b>3-3, Wall Interference Analysis by Whole Wind Tunnel CFD</b> Atsushi Hashimoto, Masataka Kohzai (JAXA, Japan)
17:15	<b>3-4, Prediction of the Aerodynamic Effect of Model Deformation during Transonic Wind Tunnel Tests</b> Sylvain Mouton, Marianne Lyonnet, Yves Le Sant (ONERA, France)
17:45	
18:00-20:00	<b>Reception (Exhibition Hall, JAXA CAC)</b>

## Thursday, October 4, 2012

9:00-16:00	<b>Registration</b>
9:30	<b>Invited Lecture 3</b> chaired by Shigeru Kuchi-Ishi (JAXA, Japan) <b>IL3, InfoSymbiotics - The power of Dynamic Data Driven Applications Systems (DDDAS)</b> Frederica Darema (Air Force Office of Scientific Research, United States of America)
10:15	<b>Coffee Break</b>
	<b>Session 4: Aeroacoustics</b> chaired by Yuichi Matsuo (JAXA, Japan)
10:45	<b>4-1, Numerical Noise Prediction of a Flap Configuration</b> Kapa-Koloszar Lilla, Patrick Rambaud, Philippe Planquart, Christophe Schram(VKI, Belgium)
11:15	<b>4-2, Computational Efforts in Designing Experiment for High-Lift Aeroacoustics</b> Mitsuhiro Murayama, Yuzuru Yokokawa, Kazuomi Yamamoto, Kazuhisa Amemiya (JAXA, Japan), Kentaro Tanaka, Tohru Hirai (Ryoyu Systems. Co. Ltd., Japan),
11:45	<b>4-3, Integrating CFD, CAA, and Experiments towards Benchmark Datasets for Airframe Noise Problems</b> Meelan Choudhari (NASA, United States of America), Kazuomi Yamamoto (JAXA, Japan)
12:15	<b>Lunch</b>
13:15	<b>Invited Lecture 4</b> chaired by Tomoyuki Higuchi (Institute of Statistical Mathematics, Japan) <b>IL4, Integration of CFD and EFD for Analysis of Complex Real Flows</b> Toshiyuki Hayase (Tohoku University, Japan)
	<b>Session 5: Data Assimilation-2</b> chaired by Tomoyuki Higuchi (Institute of Statistical Mathematics, Japan)
14:00	<b>5-1, Sensitivity Analysis of Unsteady Flow Fields and Numerical Experiments for Optimal Measurement</b> Takashi Misaka (DLR, Germany), Shigeru Obayashi (Tohoku University, Japan)
14:30	<b>5-2, Application of the Measurement Integrated Simulation Method to Compressible Fluid Problems</b> Kentaro Imagawa, Kanako Yasue, Shigeru Kuchi-Ishi (JAXA, Japan)
15:00	<b>5-3, Toward the Development of Measurement Integrated Simulation</b> Hiroshi Kato (Tohoku University, Japan)
15:30	<b>Coffee Break</b>
	<b>Session 6: Modeling/Flow Control/Wind Turbine</b> chaired by Hiromitsu Kawazoe (Tottori University, Japan)
16:00	<b>6-1, A Variable Fidelity Response Surface Approach towards Integration of CFD and EFD</b> Wataru Yamazaki (Nagaoka University of Technology, Japan), Shigeru Kuchi-Ishi (JAXA, Japan)
16:30	<b>6-2, Requirements for Computer Generated Aerodynamic Models for Aircraft Stability and Control Analysis</b> A. McCracken, U. Akram, A. Da Ronch, K.J. BadcockKenneth Badcock (University of Liverpool, United Kingdom)
17:00	<b>6-3, A Study on the Performance of Fluidic Thrust Vector Control Nozzles Utilizing Coanda Effects</b> MyungJun Song, SangHun Yoon (Korea Aerospace University, Republic of Korea), HongBeen Chang (Agency for Defense Development, Republic of Korea), YongHo Cho (Micro Friend, Inc, Republic of Korea), Yeol Lee (Korea Aerospace University, Republic of Korea)
17:30	<b>6-4, Measurements of Counter Flow Region in Averaged Wake-Velocity-Field of a Small Straight-Bladed Vertical Axis Wind Turbine</b> Yutaka Hara, Takahiro Suzuki, Hirofumi Kamon (Tottori University, Japan)
18:00	
19:00-21:30	<b>Banquet (KICHIJOJI PARK CAFE, Kichijoji Tokyu INN 1F)</b>

## Friday, October 5, 2012

8:30-10:00	<b>Registration</b>
9:00	<b>Invited Lecture 5</b> chaired by Kojiro Suzuki (The University of Tokyo, Japan) <b>IL5, CFD for Aerodynamic Flight Prediction: From Irrational Exuberance to Sobering Reality</b> Pradeep Raj (Virginia Tech, United States of America)
9:45	<b>Coffee Break</b>
	<b>Session 7: Supersonic/Hypersonic Flow</b> chaired by Keisuke Sawada (Tohoku University, Japan)
10:15	<b>7-1, A Combined Study on Shock Diffraction</b> Mark Kenneth Quinn, Konstantinos Kontis (University of Manchester, United Kingdom)
10:45	<b>7-2, Wind Tunnel and CFD Studies on Production of Prebiotic Materials in Hypersonic Flow around Extraterrestrial Entry Object</b> Kojiro Suzuki, Yasumasa Watanabe (The University of Tokyo, Japan)
11:15	<b>7-3, Experimental and Numerical Study on Shock Layer Radiation for Planetary Entry Flights</b> Gouji Yamada, Shota Ago, Yuto Kubo, Takashi Matsuno, Hiromitsu Kawazoe (Tottori University, Japan)
11:45	<b>7-4, Numerical Study on Anomalous Heating over Apollo CM Test Model in Free-Piston Shock Tunnel HIEST</b> Tomooki Ishihara, Yousuke Ogino, Keisuke Sawada (Tohoku University, Japan), Hideyuki Tanno (JAXA, Japan)
12:15-14:30	<b>Lunch (Jindaiji, Sujin-en)</b>
14:30-16:45	<b>Technical Tours (JAXA CAC)</b>
16:45-17:00	<b>Closing Ceremony</b>

**Poster Session:**

**P1, Visualization of Unsteady Behavior of Shock Waves around Supersonic Intake installed in Shock Tunnel**

Naruaki Tanaka, Toshiharu Mizukaki (Tokai University, Japan)

**P2, Experimental investigation of initial shear-layer effect on the pressure oscillation in supersonic cavity flows**

Takaya Ozaki, Shinji Maruyama (Kyushu University, Japan), Hatsuki Kakuno (Nippon Steel Engineering Co., Ltd., Japan), Taro Handa (Kyushu University, Japan)

**P3, Aerodynamic Characteristics of a Delta Wing with the Arc Camber for Mars Exploration**

Takao Unoguchi, Shogo Aoyama, Hiroshi Suemura, Gouji Yamada, Takashi Matsuno (Tottori University, Japan), Shigeru Obayashi (Tohoku University, Japan), Hiromitsu Kawazoe (Tottori University, Japan)

**P4, CFD Calculation of Airfoil Characteristics for Performance Prediction of Vertical Axis Wind Turbine**

Naoko Inoue, Kana Tanaka, Yutaka Hara, Takahiro Sumi (Tottori University, Japan)

**P5, Multi-objective Numerical exploration of Airfoil Design for Mars Aircraft**

Gaku Sasaki (Kyusyu Institute of Technology, Japan), Tomoaki Tatsukawa, Taku Nonomura (JAXA, Japan), Koichi Yonemoto (Kyusyu Institute of Technology, Japan), Akira Oyama (JAXA, Japan), Takaaki Matsumoto, Tomohiro Narumi (Kyusyu Institute of Technology, Japan)

**P6, Bow-shock instability around an edged ballistic object in a low-gamma gas**

Yosuke Sato (Tohoku University, Japan), Kanako Yasue (JAXA, Japan), Takamasa Kikuchi, Kiyonobu Ohtani, Naofumi Ohnishi (Tohoku University, Japan)

**P7, A Study on Pressure Variation of a Rotor Blade Tip using PSP**

Kidong Kim (University of Science and Technology, Republic of Korea), Kijung Kwon (KARI, Republic of Korea)

**P8, Assessment of some experimental and processing factors for background oriented schlieren measurements**

Ardian B. Gojani, Shigeru Obayashi (Tohoku University, Japan)

**P9, Dynamic Wind-Tunnel Testing of a Delta Wing Using a Multi-Degree-of-Freedom Robotic Manipulator**

Tatsuya Hara, Daiju Numata, Keisuke Asai, Takahumi Ito, Xin Jiang (Tohoku University, Japan)

**P10, Integration between Measurements and Particle Simulations for Hypersonic Rarefied Flows**

Takashi Ozawa, Toshiyuki Suzuki, Kazuhisa Fujita (JAXA, Japan)

**P11, Experimental Data Reconstruction Using CFD Results Based on Proper Orthogonal Decomposition**

Kanako Yasue, Shigeru Kuchi-Ishi, Shigeya Watanabe (JAXA, Japan)

**P12, Drag and Lift Estimation from 3-D Velocity Field Data Measured by Multi-Plane Stereo PIV**

Hiroyuki Kato (JAXA, Japan), Kisa Matsushima (University of Toyama, Japan), Makoto Ueno, Shunsuke Koike, Shigeya Watanabe (JAXA, Japan)