

PRELIMINARY PROGRAM

AHS Aeromechanics Specialists' Conference
 Holiday Inn Fisherman's Wharf
 San Francisco, California
 January 20-22, 2010



Wednesday, January 20, 2010

Plenary Session: Future Directions in Rotary Wing Science and Technology

Chair Mr. Rhett Flater, AHS International

- 8:00-8:30 Mr. Jay Dryer, Fundamental Aeronautics Program, NASA Headquarters
- 8:30-9:00 Dr. James Snider, U. S. Army, Aviation Development, AMRDEC
- 9:00-9:30 Mr. John Kinzer, U.S. Navy, Air Vehicle Technology, ONR

9:30-10:00

Break

Session	Active Control	Design I
Chair	Dr. Friedrich Straub, The Boeing Company	Prof. Ed Smith, The Pennsylvania State University
10:00-10:30	An Examination of Rotor Loads due to On-Blade Active Controls for Performance Enhancement using CFD/CSD Analysis R. Jain, HyPerComp Inc.; H. Yeo, US Army AFDD; I. Chopra, University of Maryland	Multibody Dynamics Model of a VTOL Teetering Rotor J. Shen, P.Masarati, National Institute of Aerospace
10:30-11:00	Active Rotor Controls for Vibration Reduction and Performance Enhancement K. Ravichandran, University of Maryland	A Promising New Vertical Take-Off and Landing (VTOL) Aircraft Concept J. Lawrence, Lawrence Engineering
11:00-11:30	Low-Speed and High-Speed Correlation of SMART Active Flap Rotor Loads S. Kottapalli, NASA Ames Research Center	Experimental Performance Evaluation of a MAV-Scale Cycloidal Rotor: Blade Profile Optimization M. Benedict, T. Jarugumill, I. Chopra, University of Maryland
11:30-12:00	Exploitation of Active Controls and Morphing Technologies to Enhance Rotor Aerodynamic Performance in Hover Conditions A. D'Andrea, C. Garcia-Duffy, S. Melone, AgustaWestland	Experimental Approach to Optimize an Insect-based Flapping Wing Micro Air Vehicle P. Seshadri, M. Benedict, I. Chopra, University of Maryland

12:00-1:30

Lunch

Session	Acoustics/Aero	Dynamics/Loads
Chair	Prof. Ken Brentner, The Pennsylvania State University	Mr. William Welsh, Sikorsky Aircraft Corporation
1:30-2:00	Validation of HART II Structural Dynamics Predictions Based on Prescribed Airloads S. Jung, J. Park, S. Park, Y. Yu, Konkuk University	Transient Loads Control of a Variable Speed Rotor during Resonance Crossing D. Han, J. Wang, E. Smith, G. Lesieutre, The Pennsylvania State University
2:00-2:30	Aerodynamic and Acoustic Design of a Low Noise Dual Rotor Tail-sitter J. Bain, K. Collins, Georgia Institute of Technology	Analytical, First Principles Modeling of Elastomeric Dampers S.Kottapalli, NASA Ames Research Center
2:30-3:00	Acoustics Reflections of Full-Scale Rotor Noise Measurements in NFAC 40- by 80-Foot Wind Tunnel Natasha L. Barbely, Cahit Kitaplioglu, NASA Ames Research Center; B. Sim, University of California Santa Cruz	Pitch Link Loads Reduction using Fluidlastic Isolators D. Han, E. Smith, C. Rahn, The Pennsylvania State University

3:00-3:30

Break

Session	Tiltrotors	UH-60 Computational Studies
Chair	Mr. Tom Wood, Bell Helicopter Textron	Prof. James Baeder, University of Maryland
3:30-4:00	Improving Blade-Element Design Methods for High Speed Proprotors D. Patt, Karem Aircraft; H. Youngren, Aerocraft Consulting	Icing Studies for the UH-60A Rotor in High Speed Forward Flight N. Rajmohan, J. Bain, M. Nucci, L. Sankar, Georgia Institute of Technology; R. Flemming, T. Egoal, Sikorsky Aircraft Corporation; R. Kreeger, NASA Glenn Research Center
4:00-4:30	Integration of Rotor Aerodynamic Optimization with Conceptual Design of a Large Civil Tiltrotor C. W. Acree, Jr., NASA Ames Research Center	Airloads Prediction of a UH-60A Rotor inside the 40-by-80 Foot Wind Tunnel I. Chang, E. Romander, NASA Ames Research Center; M. Potsdam, H. Yeo, US Army AFDD
4:30-5:00	Influence of Pitch Attitude on Tiltrotor Autorotation Characteristics J. Vorwald, US Naval Surface Warfare Center, Carderock Division	Numerical Simulation of Free-Flight Rockets Air-Launched From a Helicopter B. Lee, M. Jung and O. Kwon, Korea Advanced Institute of Science and Technology

Thursday, January 21, 2010

Session	Computational Aerodynamics - I	Test & Evaluation
Chair	Dr. Judah Milgram, US Naval Surface Warfare Center, Carderock Division	Mr. John O'Neill, Sikorsky Aircraft Corporation
8:00-8:30	Reduced-Order Nonlinear Unsteady Aerodynamic Modeling Using a Surrogate Based Approach P. Friedmann, B. Glaz, L. Liu, University of Michigan	Application of Out-of-Plane Warping to Control Rotor Blade Twist Y. Van Weddingen, O. Bauchau, Georgia Institute of Technology; S. Kottapalli, NASA Ames Research Center; S. Ozbay, Y. Mehrotra, Materials Technologies Corporation
8:30-9:00	CFD Simulation of UH-60 Rotor Wake for Baseline and Swashplateless Rotor A. Jose, S. Ananthan, J. Baeder, University of Maryland	Wind tunnel investigation of flow around a rotor in ground effect R.B. Green, N.D. Nathan, University of Glasgow
9:00-9:30	Loosely Coupled CFD/CSD Analysis for a Helicopter Rotor in Hover and Forward Flight S. Yoon, J. Kwak, S. Shin, C. Kim, Seoul National University	An Experimental Study of Rotorcraft in Ground Effect G. McCauley, W. Tsai, O. Savas, University of California Berkeley
9:30-10:00	Break	

Session	Computational Methods - I	Flight Control
Chair	Dr. Marty Moulton, US Army Aviation Engineering Directorate	Dr. Vineet Sahasrabudhe, Sikorsky Aircraft Corporation
10:00-10:30	Addressing today's Aerodynamic and Flight Dynamic Questions by Industrial Answers M. Dietz, P. Krämer, C. Maucher, D. Schimke, Eurocopter Deutschland GmbH	Preliminary Assessment of a Candidate Structure for Robust Rotorcraft Flight Control R. Hess, A. Pechner, University of California Davis
10:30-11:00	Large-Scale Domain Decomposition For A Scalable, Three-dimensional Brick Finite Element Based Rotor Dynamic Analysis A. Datta, ELORET Corporation; W. Johnson, NASA Ames Research Center	Simulation of Dynamic Interface Flight Control Concepts Using the CHARM Toolbox for MATLAB R. McKillip, Jr., T. Quackenbush, J. Keller, G. Whitehouse, D. Wachspress, Continuum Dynamics, Inc.
11:00-11:30	Parallel Computing for Rotorcraft Structural Dynamics Analysis H. Kang, H. Saberi, Advanced Rotorcraft Technology, Inc.	Development and Operation of an Automatic Rotor Trim Control System for Use During the UH-60 Individual Blade Control Wind Tunnel Test C. Theodore, NASA Ames Research Center
11:30-12:00	Rotor Loads Identification Methodologies at AgustaWestland E. Fosco, F. Vincenzo, A. Colombo, P. Nour, C. Monteggia, N. Griffiths, C. Hutchin, V. Caramaschi, AgustaWestland	Modeling Biodynamic Interference in Helicopter Piloting Tasks R. Hess, University of California Davis
12:00-1:30	Lunch	

Session	Computational Methods - II	Rotor Performance
Chair	Prof. Inderjit Chopra, University of Maryland	Dr. Shigeru Saito, Japan Aerospace Exploration Agency
1:30-2:00	CFD Method for Efficient Analysis of Flapped Rotors R. Steijl, M. Woodgate, G. Barakos, University of Liverpool	Experimental and Analytical Studies of Lifting Rotor Performance at High Advance Ratios T. Quackenbush, D. Wachspress, R. McKillip, Jr., M. Sibilia, Continuum Dynamics, Inc.
2:00-2:30	Hybrid CFD Method for Coaxial Rotor Performance Prediction in Forward Flight T. Egolf, Sikorsky Aircraft Corporation; N. Rajmohan, Georgia Institute of Technology; E. Reed, Sikorsky Aircraft Corporation; L. Sankar, Georgia Institute of Technology	Performance and Trim Analysis of Lightly Loaded Rotors in High Advance Ratio Autorotation J. Rigsby, JVR Prasad, Georgia Institute of Technology
2:30-3:00	A Comparison of Three Coaxial Aerodynamic Prediction Methods Including Validation With Model Test Data O. Juhasz, M. Syal, R. Celi, University of Maryland; O. Rand, Technion; G. Ruzicka, R. Strawn, US Army AFDD	Applications of the Induced Power Model and Performance of Conventional and Advanced Rotorcraft R. Ormiston, US Army AFDD
3:00-3:30	Break	

Session	Computational Aerodynamics - II	Rotor Flow Fields
Chair	Prof. Marilyn Smith, Georgia Institute of Technology	Prof. Ganesh Rajagopalan, Iowa State University
3:30-4:00	Computational Investigation of Micro-Scale Shrouded Rotor Aerodynamics in Hover V. Lakshminarayan, D. Lummer, J. Baeder, University of Maryland	Unsteady Numerical Simulations of Helicopters and Tiltrotors operating in sandy-desert environments A. D'Andrea, AgustaWestland
4:00-4:30	Predicting Hub Drag on Realistic Geometries J. Bridgeman, G. Lancaster, Bell Helicopter Textron Inc.	Investigation of Hybrid Grid-Based CFD Methods for Rotorcraft Flow Analysis G. Whitehouse, Continuum Dynamics, Inc.; H. Tadghighi, The Boeing Company
4:30-5:00	Experimental and Numerical Studies of Rotor/Fuselage Interactions Y. Tanabe, S. Saito, Japan Aerospace Exploration Agency	Optimization of Overset Solution Adaptive Grids for Hovering Rotorcraft Flows T. Holst, T. Pulliam, NASA Ames Research Center

<p>Banquet - Pacific Ballroom Guest Speaker: Lt. Col. Gregg Skinner, US Marine Corp</p>
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Friday, January 22, 2010

Session	Experimental Methods	CFD/CSD
Chair	Mr. Luther Jenkins, NASA Langley Research Center	Prof. Lakshmi Sankar, Georgia Institute of Technology
8:00-8:30	Retroreflective Background Oriented Schlieren (RBOS) as Applied to Full-scale UH-60 Blade Tip Vortices J.Heineck, NASA Ames Research Center; L. Kushner, University of California Santa Cruz; E. Schairer, NASA Ames Research Center; L. Walker, University of California Santa Cruz	Development of a CFD-CSD-Based Reduced Order Model for Coupled Aeroelastic Rotor Predictions J. Abras, US Navy, NAVAIR
8:30-9:00	Non-intrusive measurements of a four-bladed rotor in hover – a first look O.Wong, K. Noonan, US Army AFDD; A.Watkins, L. Jenkins, C. Yao, NASA Langley Research Center	An Analysis of Loose and Tight CFD/CSD Coupling for Rotorcraft N.Reveles, A. Zaki, M. Smith, O. Bauchau, Georgia Institute of Technology
9:00-9:30	Blade Deformation Measurements of a Full-Scale UH-60A Rotor System L. Olson, NASA Ames Research Center; D. Barrows, NASA Langley Research Center; A. Abrego, NASA Ames Research Center; A. Burner, Jacobs Technology, Inc.	Wake-Coupling CFD-CSD Analysis of Helicopter Rotors in Steady and Maneuvering Flight Conditions S.Thomas S. Ananthan, J. Baeder, University of Maryland

9:30-10:00	Break
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Session	Design II	Dynamic Stall
Chair	Mr. Marc Sheffler, The Boeing Company	Dr. Ashish Bagai, Sikorsky Aircraft Corporation
10:00-10:30	NDARC – NASA Design and Analysis of Rotorcraft: Theoretical Basis and Architecture W. Johnson, NASA Ames Research Center	Unified Airloads Model for Morphing Airfoils in Dynamic Stall L. Ahaus, D. Peters, Washington University
10:30-11:00	NDARC – NASA Design and Analysis of Rotorcraft: Validation and Demonstration W. Johnson, NASA Ames Research Center	Mitigation of Dynamic Stall Using Small Controlled Devices T. Wong, US Army AED
11:00-11:30	Design of a Slowed Rotor Compound Helicopter for Future Joint Service Missions C. Silva, H. Yeo, US Army AFDD; W. Johnson, NASA Ames Research Center	An Exploration of the Physics of Dynamic Stall V. Raghav, P. Richards, N. Komerath, M. Smith, Georgia Institute of Technology
11:30-12:00	Converting a C-130 Hercules into a Compound Helicopter: A Conceptual Design Study A. Kottapalli, Massachusetts Institute of Technology; F. Harris, F. D. Harris & Associates	Trailing edge flap flow control for dynamic stall R.B. Green, E.A. Gillies, Y. Wang, University of Glasgow