

# **68th American Helicopter Society International Annual Forum 2012**

**Vertical Flight Technical Society**

**Fort Worth, Texas, USA  
1-3 May 2012**

**Volume 1 of 4**

**ISBN: 978-1-62276-051-0**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2012) by the American Helicopter Society International  
All rights reserved.

Printed by Curran Associates, Inc. (2012)

For permission requests, please contact the American Helicopter Society International  
at the address below.

American Helicopter Society International  
217 N. Washington Street  
Alexandria, VA 22314-2538

Phone (703) 684-6777

Fax: (703) 739-9279

[staff@vtol.org](mailto:staff@vtol.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

## VOLUME 1

### ACOUSTICS

<b>Automated Design of Noise-Minimal, Safe Rotorcraft Trajectories</b> .....	1
<i>Morris, Robert A.; Venable, Kristen; Lindsay, James</i>	
<b>Localized, Non-Harmonic Active Flap Motions for Low Frequency In-Plane Rotor Noise Reduction</b> .....	8
<i>Sim, Ben W.; Potsdam, Mark; Kitaplioglu, Cahit; Lemasurier, Philip; Lorber, Peter; Andrews, Joseph</i>	
<b>Maneuver Acoustic Flight Test of the Bell 430 Helicopter</b> .....	24
<i>Snider, Royce; Greenwood, Eric; Baden, Joel; Watts, Michael</i>	
<b>Prediction of BVI Noise for an Active Twist Rotor Using a Loosely Coupled CFD/CSD Method and Comparison to Experimental Data</b> .....	41
<i>Wilbur, Matthew; Sekula, Martin; Boyd, D. Douglas, Jr.</i>	
<b>A Semi-Empirical Noise Modeling Method for Helicopter Maneuvering Flight Operations</b> .....	55
<i>Schmitz, Fredric; Sickenberger, Richard; Greenwood, Eric</i>	
<b>Understanding In-Plane Helicopter Blade-Vortex Interaction (BVI) Noise</b> .....	73
<i>Koushik, Sudarshan; Schmitz, Fredric</i>	

### ADVANCED VERTICAL FLIGHT

<b>Computations and Experiments on Flow Physics of Edgewise Ducted Fan Air Vehicles</b> .....	85
<i>Halwick, Jason M.; Lindau, Jules; Dreyer, James; McLaughlin, Dennis</i>	
<b>Design and Testing of a Dual Tilt-Wing Micro Air Vehicle</b> .....	95
<i>Hrishikeshavan, Vikram; Chopra, Inderjit</i>	
<b>Experimental Investigation of the Forward Flight Performance of a MAV-Scale Cycloidal Rotor</b> .....	112
<i>Jarugumilli, Tejaswi; Benedict, Moble; Chopra, Inderjit</i>	
<b>H.E.R.O. - Conceptual Study of a Multi-Role Rotary-Wing Aircraft for Exceptional Maneuverability and Advanced Stealth Technology</b> .....	131
<i>Nohturfft, Nils A.; Zierhut, Sonya; Tran, Matthew; Young, Nathan</i>	
<b>Tailless Flapping Wing Propulsion and Control Development for the Nano Hummingbird Micro Air Vehicle</b> .....	143
<i>Keennon, Matthew; Klingebiel, Karl; Won, Henry; Andriukov, Alexander</i>	

### AERODYNAMICS

<b>An Assessment of CFD/CSD Prediction State-Of-The-Art Using the HART II International Workshop Data</b> .....	165
<i>Smith, Marilyn J.; Lim, Joon W.; Van Der Wall, Berend; Baeder, James D.; Biedron, Robert; Boyd, D. Douglas, Jr.; Jayaraman, Buvana; Jung, Sung N.; Byung-Young, Min</i>	
<b>An Assessment of Comprehensive Code Prediction State-Of-The-Art Using the HART II International Workshop Data</b> .....	206
<i>Lim, Joon W.; Smith, Marilyn J.; Jung, Sung N.; Bailly, Joelle; Baeder, James D.; Boyd, D. Douglas, Jr.; Van Der Wall, Berend</i>	
<b>Compressibility Effects on Aerodynamic Damping During Dynamic Stall Events</b> .....	246
<i>Bowles, Patrick O.; Wasikowski, Mark; Coleman, Dustin; Corke, Thomas; Thomas, Flint</i>	
<b>Compressible Dynamic Stall Mechanisms Due to Airfoil Pitching and Freestream Mach Oscillations</b> .....	266
<i>Jensen, Chris; Gregory, James; Bons, Jeffrey; Gompertz, Kyle</i>	
<b>Computational Investigation and Fundamental Understanding of a Slowed UH-60A Rotor at High Advance Ratios</b> .....	285
<i>Potsdam, Mark; Datta, Anubhav; Jayaraman, Buvana</i>	
<b>Detached Eddy Simulation of the UH-60 Rotor Wake Using Adaptive Mesh Refinement</b> .....	309
<i>Chaderjian, Neal M.; Ahmad, Jasim</i>	
<b>Drag Prediction of Two Production Rotor Hub Geometries</b> .....	326
<i>Dombroski, Mike; Egoft, T. Alan</i>	
<b>Dynamical and Evolutionary Characteristics of the Tip Vortex from a Four-Bladed Rotor in Hover</b> .....	335
<i>Mula, M. Swathi; Timney, Charles; Sirohi, Jayant; Stephenson, James</i>	
<b>EC145 T2 - Comprehensive and Challenging Industrial CFD Applications</b> .....	354
<i>Dietz, Markus; Schimke, Dieter; Kneisch, Thomas; Roth, German; D'Alascio, Alessandro</i>	
<b>An Examination of Unsteady Airloads on a UH-60A Rotor: Computation Vs. Measurement</b> .....	369
<i>Lee-Rausch, Elizabeth; Biedron, Robert T.</i>	
<b>Experimental - Numerical Investigation of the Retreating Blade Dynamic Stall</b> .....	383
<i>Zanotti, Alex; Melone, Stefano; Niljard, Reza; D'Andrea, Andrea</i>	
<b>Flow Environment and Organized Turbulence Structures at the Ground Below a Rotor</b> .....	396
<i>Rauleder, Jurgan; Leishman, J. Gordon</i>	
<b>Helicopter Rotor Airload Predictions with a Comprehensive Rotorcraft Analysis</b> .....	418
<i>Wachspress, Daniel A.; Yu, Ke; Saberi, Hossein; Hasbun, Matthew; Ho, Jimmy; Yeo, Hyeonsoo</i>	
<b>Helios Adaptive Mesh Refinement for HART II Rotor Wake Simulations</b> .....	440
<i>Lim, Joon W.; Wissink, Andrew; Jayaraman, Buvana; Dimanlig, Arsenio</i>	

<b>Influence of Rotation on Dynamic Stall</b> .....	464
<i>Gardner, A. D.; Richter, Kai</i>	
<b>Investigation of Dynamic Stall Control by Deployable Vortex Generator Using Time-Resolved PIV Analysis and URANS Computations</b> .....	475
<i>Le Pape, Arnaud; Heine, Benjamin; Huberson, Serge; Joubert, G.</i>	
<b>Investigation of Tip Vortex Aperiodicity in Hover</b> .....	487
<i>Karpatne, Anand; Sirohi, Jayant; Mula, Swathi M.; Tinney, Charles</i>	
<b>Multi-Fidelity Modeling of Separated Flow Control with Nanosecond Pulsed Plasma Actuation</b> .....	498
<i>Glaz, Bryan; Gaitonde, Datta; Dinavahi, Surya</i>	
<b>Multi-Objective Aerodynamic Design of Tilt-Rotor Airframe Components by Means of Genetic Algorithms and CFD</b> .....	511
<i>Benini, Ernesto; Ponza, Rita; Garavello, A.</i>	
<b>Numerical and Experimental Investigation of Helicopter Fuselage Drag Reduction Using Active Flow Control</b> .....	527
<i>Lienard, Caroline; Le Pape, Arnaud; Verbeke, Christophe</i>	
<b>Particle Image Velocimetry in Helicopter Aerodynamics: Developments, Challenges and Trends</b> .....	544
<i>Raffel, Markus; Mulleners, Karen; Kindler, Kolja; Heineck, James</i>	
<b>Rotor Aeromechanics Results from the Sikorsky Active Flap Demonstration Rotor</b> .....	553
<i>Wake, Brian; Hein, Benjamin; Wong, Jonathan; Lorber, Peter</i>	
<b>Wind Tunnel Measurements of Full-Scale UH-60A Rotor Tip Vortices</b> .....	569
<i>Yamauchi, Gloria; Wadcock, Alan; Johnson, Wayne; Ramasamy, Manikandan</i>	

## **AIRCRAFT DESIGN**

<b>Aerodynamic Design Optimization of Proprotors for Convertible Rotor Concepts</b> .....	593
<i>Stahlhut, Conor; Leishman, J. Gordon</i>	
<b>A Comparative Study of Different Weight Formulations Affecting Preliminary Sizing of Rotorcraft</b> .....	617
<i>Karla, Tarandeep S.; Amiraux, Mathieu; Nagaraj, Vengalattore; Baeder, James D.; Chopra, Inderjit</i>	
<b>A Composite Rotor Blade Structural Design Environment for Aeromechanical Assessments in Conceptual and Preliminary Design</b> .....	632
<i>Rohl, Peter J.; Kumar, Devesh; Dorman, Paul; Sutton, Mark; Cesnik, Carlos</i>	
<b>Design Optimization of Gamera II: A Human Powered Helicopter</b> .....	646
<i>Berry, Ben; Bowen-Davies, Graham; Gluesenkamp, Kyle; Kaler, Zak; Schmaus, Joseph; Staruk, William; Weiner, Elizabeth; Woods, Benjamin</i>	
<b>Development of a Quad Shrouded Rotor Micro Air Vehicle and Performance Evaluation in Edgewise Flow</b> .....	665
<i>Black, James; Chopra, Inderjit; Hrishikeshavan, Vikram</i>	
<b>A Framework for Cost-Benefit Analysis of Tiltrotor Aircraft</b> .....	685
<i>Scott, Robert; Schrage, Daniel</i>	
<b>Hover Performance Improvement with Warp-Induced Spanwise Camber Variation</b> .....	693
<i>Mistry, Mihir; Gandhi, Farhan</i>	
<b>Hover Testing of a Swashplateless Rotor with Compact Brushless Motor Actuated Flaps for Primary Control</b> .....	710
<i>Saxena, Anand; Chopra, Inderjit</i>	
<b>The Lightning Indirect Effect Protection of More Electrical and More Composite Modern Helicopters</b> .....	719
<i>Poncon, Marc; Guillet, Steven; Gosmain, Anne</i>	
<b>Redesign of the AH-64 Apache Composite Main Rotor Blade Attachment Fittings to Provide a Field Repair Capability</b> .....	730
<i>Reid, Len; Loftus, Robert</i>	

## **AVIONICS & SYSTEMS**

<b>AH-6: Creating an Agile Software Product Line Architecture</b> .....	737
<i>Augenstein, Andrew</i>	
<b>Apache Mission Processor Software: Partitioning &amp; Distributed Display Architecture</b> .....	745
<i>Koontz, Ronald</i>	
<b>Development of Virtual Pilot Laboratory (VPLab) Toolset in Support of Aircraft Avionics Testing and Evaluation</b> .....	754
<i>Lee, Dooyong; He, Chengjian; Saberi, Hossein; Duval, Ronald</i>	

## **VOLUME 2**

<b>Further Study on the Blade-Tip Proximity Warning Laser System</b> .....	772
<i>Zhou, Yaoming; Song, Jingjing; Wu, Zhe; Zhang, Lei</i>	
<b>LandSafe® Precision Flight Instrumentation System, the DVE Solution</b> .....	781
<i>Dakin, Elizabeth; Mamidipudi, P.; Dakin, Daniel; Bienlien, Timothy; Vang, Donald; Rogers, Philip</i>	
<b>Leveraging Emerging Embedded Processing Trends in Rotorcraft Advanced Open System Architectures (AOSA)</b> .....	792
<i>Gaska, Thomas</i>	
<b>Lightweight Metal Rubber Electrical Cables</b> .....	809
<i>Dippold, Amanda; Homer, Michelle; Dennis, Jacob; Claus, Richard</i>	
<b>Open Networking Technologies for the Integration of Net-Ready Applications on Rotorcraft</b> .....	812
<i>Dubois, Thomas A.; Blanton, Brendan; Johnson, Randy; Kinahan, William; Reetz, Ferdinand; Endler, Markus; Baptista, Gustavo</i>	

<b>Operational Relevance of the Link16 Datalink to AH-64 Apache</b> .....	822
<i>Leong, Michael</i>	
<b>Rotorcraft Avionics Designs for Tomorrows Capabilities</b> .....	831
<i>Palich, Mark E.</i>	

### **CHEESEMAN AWARD**

<b>Investigation of Dynamic Stall Control by Deployable Vortex Generator Using Time-Resolved PIV Analysis and URANS Computations</b> .....	838
<i>Le Pape, Arnaud; Heine, Benjamin; Huberson, Serge; Joubert, G.</i>	

### **CRASH SAFETY**

<b>Analysis and Control of A Magnetorheological Landing Gear System For a Helicopter</b> .....	850
<i>Choi, Young-Tai; Robinson, Ryan; Hu, Wei; Wereley, Norman M.; Birchette, Terence S.; Bolukbasi, Akif; Woodhouse, Jin</i>	
<b>Applying Fem for Development of an Impact Resistant Aircraft Windshield</b> .....	860
<i>Lu, Zi; Schadler, Jeremy; Tho, Cheng-Ho</i>	
<b>Calibration of Airframe and Occupant Models for Two Full-Scale Rotorcraft Crash Tests</b> .....	876
<i>Annett, Martin; Horta, Lucas; Polanco, Michael</i>	
<b>Crashworthy Seat Cushion Change Considerations</b> .....	893
<i>Parson, Curt; Harris, Alex</i>	
<b>The Evolution and Limitations of Lumbar Spine Injury Criteria for Evaluating Crashworthy Seating Systems</b> .....	898
<i>Richards, Marvin</i>	
<b>Lightweight Magnetorheological Energy Attenuation System for Rotorcraft Seats</b> .....	905
<i>Hu, Wei; Ngatu, Grun T.; Hiemenz, Gregory J.; Wereley, Norman M.; Woodhouse, Jin</i>	
<b>Optimal Occupant Protection Using Vertically Stroking Seat Suspensions with Magnetorheological Energy Absorbers</b> .....	915
<i>Singh, Harinder J.; Wereley, Norman M.</i>	
<b>Rate Effects and Environmental Sensitivity of Textile Energy Absorbers</b> .....	931
<i>Miller, Simon; Little, Eric; Yukish, Michael; Bakis, Charles; Smith, Edward</i>	
<b>Side-Facing Aircraft Seat Injury Criteria</b> .....	945
<i>Deweese, Rick; Moorcroft, David; Abramowitz, Allan; Pelletiere, Joseph A.</i>	
<b>A Systems Approach to Crashworthiness</b> .....	955
<i>Crocco, John</i>	

### **CREW STATIONS & HUMAN FACTORS**

<b>Flight Evaluation of Fully-Masked Approaches to Landing Using Boss Displays in an Eh-60L</b> .....	966
<i>Szoboszlai, Zoltan; Ott, Carl</i>	
<b>Rotary Wing UAS Operator Training Simulator</b> .....	978
<i>Isci, Hakan; Ezertas, Ozgur; Kapulu, Ozge</i>	

### **DYNAMICS**

<b>Active Cabin Vibration Control for Light Single and Twin Engine Helicopters</b> .....	983
<i>Dreher, Stefan; Konstanzer, Peter; Hoffmann, Falk; Kerdreux, Benjamin; Jouve, Jérémy; Priems, Martijn</i>	
<b>Aeromechanics of a Variable-Radius Rotor</b> .....	992
<i>Bowen-Davies, Graham; Chopra, Inderjit</i>	
<b>Assessment of Shell and Beam Elements for Modeling Rotorcraft Blades</b> .....	1008
<i>Kang, Hao; Chang, Chongseok; Saberi, Hossein; Ormiston, Robert</i>	
<b>Computational Modeling of Diving-turn Maneuvers Using a Hybrid Methodology</b> .....	1033
<i>Marpu, Ritu P.; Sankar, Lakshmi N.; Makinen, Steve; Baeder, James D.</i>	
<b>Coupled CSD/CFD and Viscous Vortex Particle Method for Rotorcraft Comprehensive Analysis</b> .....	1050
<i>Zhao, Jinggen; He, Chengjian</i>	
<b>Development and Hover Testing of the Active Elevon Rotor</b> .....	1074
<i>Fulton, Mark V.; Gold, Nili; Nielsen, Gavin; Mansur, Mohammadreza; Tischler, Mark; Domzalski, David</i>	
<b>Dynamics of a High-Authority Active Flap Rotor</b> .....	1102
<i>Wong, Jonathan; Andrews, Joseph; Brigley, Mikel</i>	
<b>Extensive Validation of CFD/CSD Aeroelastic Simulations for a Helicopter in Descending Flight</b> .....	1116
<i>Park, Jae-Sang; Jung, Sung N.; You, Young-Hyun; Sa, Jeong-Hwan; Park, Soo-Hyung</i>	
<b>Helicopter Rotor Structural Load Predictions with a Comprehensive Rotorcraft Analysis</b> .....	1133
<i>Wachspress, Daniel; Yu, Ke; Saberi, Hossein; Hasbun, Matthew; Ho, Jimmy; Yeo, Hyeonsoo</i>	
<b>An H<sub>∞</sub> Technique for Improved Higher Harmonic Control</b> .....	1161
<i>Fan, Frank; Hall, Steven R.</i>	
<b>In-Flight Demonstration of Active Vibration Control Technologies on the Bell 429 Helicopter</b> .....	1173
<i>Heverly, David, II; Mahmood, Raheel</i>	

<b>Innovative Systems to Reduce One Per Rev Vibrations in Helicopters</b> .....	1183
<i>Lengyel, Attila; Wilson, Mark</i>	
<b>Investigation of Performance and Loads of a UH-60A Rotor at High Advance Ratios</b> .....	1197
<i>Yeo, Hyeonsoo</i>	
<b>Lead-Lag Stability Predictions: Why CFD is Needed</b> .....	1220
<i>Morillio, Jorge A.; Ahaus, Loren; Reveles, Nicolas; Smith, Marilyn J.</i>	
<b>Loads Correlation of a Full-Scale UH-60A Airloads Rotor in a Wind Tunnel</b> .....	1247
<i>Yeo, Hyeonsoo; Romander, Ethan A.</i>	
<b>On the Necessity of High-Fidelity Aeroelastic Modeling of On-Blade Control Surface for Helicopter Vibration Suppression</b> .....	1270
<i>Ulker, Fatma Demet; Voutsinas, Sypridon; Riziotis, Vasilis; Nietzsche, Fred</i>	
<b>Optimization Framework for Dynamic Analysis and Design of Active Twist Rotors</b> .....	1280
<i>Kumar, Devesh; Rohl, Peter; Sutton, Mark; Cesnik, Carlos E. S.</i>	
<b>Performance and Vibratory Load Measurements of a Slowed Rotor at High Advance Ratios</b> .....	1293
<i>Berry, Ben; Chopra, Inderjit</i>	
<b>Robust Stability Analysis: A Tool to Assess the Impact of Biodynamic Feedthrough on Rotorcraft</b> .....	1306
<i>Quaranta, Giuseppe; Masarati, Pierangelo; Venrooij, Joost</i>	
<b>Simultaneous BVI Noise and Vibration Reduction in Rotorcraft Using Microflaps Including the Effect of Actuator Saturation</b> .....	1316
<i>Padthe, Ashwani; Friedmann, Peretz P.; Bagnoud, Francois-Xavier</i>	
<b>Theoretical and Experimental Investigation of Aeroelastic Rotorcraft-Pilot Coupling</b> .....	1339
<i>Quaranta, Giuseppe; Lu, Linghai; Jump, Michael; Masarati, Pierangelo</i>	
<b>Upstream Active Gurney Flap for Rotorcraft Vibration Reduction</b> .....	1354
<i>Bae, Eui Sung; Gandhi, Farhan</i>	

## **HANDLING QUALITIES**

<b>ADS-33 Handling Qualities Evaluation of the UH-60M Fly-By-Wire Demonstration Aircraft</b> .....	1363
<i>Luria, Frank; Smith, F. Scott; Harding, Jeffrey; Mouser, Adam</i>	
<b>ADS-33E-PRF Specification Application Package (ASAP)</b> .....	1379
<i>Hoh, Roger H.; Nicoll, Thomas; Heffley, Robert; Mitchell, David</i>	
<b>CH-53K Control Law Risk Reduction Flight Testing on the Rascal JUH-60A In-Flight Simulator</b> .....	1392
<i>Greenfield, Aaron; Kubik, Stephen; Faynberg, Alex; Litwin, Jonathan; Marzella, Steven; Sahasrabhude, Vineet; Rucci, John; Corry, Christian; Pavelka, Ed; Rhinehart, Matthew; Roark, Sean; Fletcher, Jay W.; Ott, Carl</i>	
<b>Design and Flight Test of a Cable Angle/Rate Feedback Flight Control System for the RASCAL JUH-60 Helicopter</b> .....	1405
<i>Ivler, Christina M.; Tischler, Mark; Powell, J. David; Fletcher, Jay; Ott, Carl</i>	
<b>Development of a Fly-By-Wire Flight Control System to Achieve Level 1 Handling Qualities on a BLACK HAWK Helicopter</b> .....	1430
<i>Cherepinsky, Igor; Driscoll, Joe; Magonigal, Sean; Silder, Stephen</i>	
<b>Flight Dynamic Simulation Modeling of Large Flexible Tiltrotor Aircraft</b> .....	1441
<i>Juhasz, Ondrej; Celi, Roberto; Ivler, Christina; Tischler, Mark; Berger, Tom</i>	
<b>Gust Rejection Using Active Trailing Edge Flaps</b> .....	1472
<i>Montanye Hayes, Pam; Grill, Ivan; Horn, Joseph</i>	
<b>Handling Qualities of a Large Civil Tiltrotor in Hover Using Translational Rate Command</b> .....	1488
<i>Malpica, Carlos A.; Theodore, Colin; Lawrence, Ben; Lindsey, James; Blanken, Chris</i>	
<b>In Flight Evaluation of Active Inceptor Force-Feel Characteristics and Handling Qualities</b> .....	1509
<i>Lusardi, Jeff A.; Blanken, Chris; Malpica, Carlos; Ott, Carl; Von Gruenhagen, Wolfgang</i>	
<b>Modeling Issues in the Prediction of the Modulation Transfer Function of a Brownout Cloud</b> .....	1527
<i>Tritschler, John; Celi, Roberto</i>	

## **VOLUME 3**

<b>Transformational Vehicle Management Systems</b> .....	1545
<i>Fallon, Michael P.; Blanken, Christopher L.; Montanye, Pamela; Kashawlic, Bryan; Labus, Gregory; Grill, Ivan; Campbell, Kip; Shue, Jack; Schillings, John; Horn, Joseph H.</i>	
<b>Variance Constrained Control of Maneuvering Helicopters</b> .....	1568
<i>Sultan, Cornel; Oktay, Tugrul</i>	
<b>X2™ Load Alleviating Control Laws</b> .....	1578
<i>Eller, Erez</i>	

## **HEALTH & USAGE MONITORING SYSTEMS (HUMS)**

<b>Analysis of Magnetic Communications for Use on Rotorcraft</b> .....	1588
<i>Bajekal, Sanjay; Lakamraju, Vijay; Soldner, Nicholas</i>	
<b>Architecture for a Light Helicopter HUMS</b> .....	1593
<i>Bechhoefer, Eric; Augustine, Mike; Kingsley, Michael</i>	

<b>Blind Source Separation and Blind Equalization for Vibration Based Diagnostics of Rotorcraft Bearings</b> .....	1601
<i>Ghoshal, Anindya; Dykas, Brian; Haile, Mulugeta</i>	
<b>A Data Mining Based Approach for Gear Fault Diagnostics Using Vibration Sensors</b> .....	1609
<i>Li, Ruoyu; He, David; Menon, Praneet</i>	
<b>Development of a Fatigue Life Management System for Dynamic Components on the OH-58D Kiowa</b> .....	1617
<i>Mochache, Joshua; Baker, Terry; Hobbs, Ron; Yu, Rebecca; Tucker, Brian</i>	
<b>Evaluation of a Novel Adaptive Thresholding and Trend Alert Generation Technology on a HUMS Equipped Fleet</b> .....	1635
<i>Krick, Steven M.; Wade, Daniel; Pipe, Kenneth</i>	
<b>In-Flight Seeded-Fault Monitoring of URV Components Under Operating and Extreme Maneuvering Conditions</b> .....	1641
<i>Coatney, Michael; Chung, Howard; Pappakostas, Mark; Ayers, James; Ghoshal, Anindya; Beard, Shawn; Le, Dy; Chang, Fu-Kuo</i>	
<b>An Integrated Approach for Gear Health Prognostics</b> .....	1647
<i>He, David; Bechhoefer, Eric; Dempsey, Paula; Ma, Jinghua</i>	
<b>Lubricant Condition Assessment System (LUCAS), an Enabler for Condition Based Maintenance Best Practice</b> .....	1656
<i>Mimmella, Chris; Byington, Carl; Moffatt, John</i>	
<b>Measurement of Gearbox Surface Frequency Response Functions for HUMS Algorithm Improvement</b> .....	1663
<i>Wade, Daniel; Larsen, Chris</i>	
<b>Methods to Reduce Seeded-Fault Test Requirements for CBM Initiatives</b> .....	1676
<i>Kasper, David G.; Watson, Matthew; Bolander, Nathan; Lohr, Tina; Wade, Daniel; Davis, Mark; Fetty, Jason</i>	
<b>Micropower Wireless Strain Sensor for Rotorcraft Applications</b> .....	1694
<i>Townsen, C. P.; Arms, Steven; Bessette, Justin; Jones, Allen; Thompson, Bruce; Baker, Treven</i>	
<b>Natural Fatigue Crack Initiation and Detection in High Quality Spur Gears</b> .....	1700
<i>Stringer, David; Laberge, Kelsen; Burdick, Cory; Fields, Brendan</i>	
<b>Operations Support and Sustainment Technology (OSST) Program to Enable Condition-Based Maintenance (CBM)</b> .....	1707
<i>Taker, Brian; Girard, William; Baker, Treven; Thompson, Bruce; Bordick, Nathaniel</i>	
<b>Polymeric Bead Matrix Technology for On-Board CBM of Fluid-Lubricated Aircraft Components</b> .....	1732
<i>Hedges, Joe; Gonzales, David; Averett, Joe; Hanks, Britt; Coleman, Bud; Augustine, Mike</i>	
<b>Technology Development to Enable Capability-Based Operations and Sustainment</b> .....	1741
<i>Bates, Preston R.; Cycon, Jim; Davis, Mark; Baker, Treven; Thompson, Bruce; Bordick, Nathaniel</i>	
<b>Testing a Passive RFID System on Rotorcraft for Tracking Dynamic Components</b> .....	1753
<i>Algera, Doug; Bradfield, Scott; Singh, A.; Owen, R.; Mareedu, S.; Iyyer, N.; Semidey, R.; Thomas, J.</i>	
<b>Wireless Sensor and Network Architectures for HUMS</b> .....	1763
<i>Loverich, Jacob; Wenner, Steven</i>	

## **HISTORY**

<b>1907 Cornu Helicopter Concept Revisited - Performance Measurements of a 1/6-Scale Model of the Rotor</b> .....	1775
<i>Hance, Ben; Milluzzo, Joe; Leishman, J.</i>	
<b>Gustave De Ponton D'Amecourt, Gaspard Félix Tounachon and Guillaume Joseph Gabriel De La Landelle: a Re-Evaluation of the Contributions of the "Triumvirat Hélicoptéroïdal" to the Early History of Rotary-Wing Flight</b> .....	1783
<i>Charnov, Bruce H.</i>	
<b>A Historical Perspective on the Application of Autonomy in Rotorcraft</b> .....	1796
<i>Collins, Angelo N.; Cummings, Mary L.</i>	
<b>An Interview with the First Branch Chief of Army Aviation Major General Carl H. McNair, Jr., USMA '55</b> .....	1808
<i>Fardink, Paul</i>	
<b>Knight, Dutton, Castles, and the Early Rotorcraft Researchers at Georgia Tech</b> .....	1835
<i>Scott, Robert</i>	
<b>Reflections on Professor Kurt Hohenemser's Pioneering Contributions to Helicopters and Wind Turbines</b> .....	1843
<i>Gaonkar, Gopal H. ; Peters, David</i>	
<b>The Work of Spanish Helicopter Pioneer Federico Cantero Villamil, and a Preliminary Design and Performance Review of the Helicopter Libélula Española</b> .....	1854
<i>Piñero Jr., Erasmo</i>	

## **HOST, CHRISTIAN**

<b>High Speed Long Range MEDEVAC -Critical Care Transport – Level II to Level III - Implications on Medical Treatment Facilities</b> .....	1860
<i>Host, Christian</i>	

## **MANUFACTURING TECHNOLOGY AND PROCESSING**

<b>Additive Manufacturing for the Aerospace Industry</b> .....	1876
<i>Thomas, Darin; Sabin, Greg</i>	
<b>Development of a Novel Erosion Resistant Coating System for Use on Rotorcraft Blades</b> .....	1889
<i>Trexler, Matthew D.; Champagne, Victor; Kopchik, Jack</i>	
<b>Evaluation of Titanium Bonding Surface Preparation Method: Sol-Gel AC-130-2</b> .....	1898
<i>Wong, John T.</i>	

<b>An Overview of H-60 A2L Remanufacturing</b> .....	1911
<i>Allard, Richard L., Jr.</i>	
<b>Rotor Blade Manufacturing Process Tradeoffs Using a Cost/Time Analysis</b> .....	1921
<i>Sirirojvsiuth, Apinut (Nate); Schrage, Daniel</i>	
<b>Spring-In Behavior of Thick Composites - Experimental Investigations</b> .....	1931
<i>Chiou, Pin Lin; Boszak, Kathleen</i>	

## **MODELING AND SIMULATION**

<b>Adjoint-Based Unsteady Airfoil Design Optimization with Application to Dynamic Stall</b> .....	1940
<i>Mani, Karthik; Lockwood, Brian; Mavriplis, Dimitri</i>	
<b>Computational Study of the Roles of Shrouds and Multiphase Flow in High Speed Gear Windage Loss</b> .....	1953
<i>Kunz, Robert F.; Hill, Matthew; Schmehl, Kerrie; McIntyre, Sean</i>	
<b>An Efficient POD Based Technique to Model Rotor/Ship Airwake Interaction</b> .....	1964
<i>Zhao, Jinggen; He, Chengjian; Kim, Jeewoong; Sankar, Lakshmi. N.; Prasad, J. V. R; Rajmohan, Nischint</i>	
<b>Generic Research Simulator Requirements for Prediction of Adverse Rotorcraft Pilot Couplings in the Heave Axis</b> .....	1983
<i>Jump, Michael; Jones, Michael</i>	
<b>GenHel Rotor Blade Airfoil Unsteady Aerodynamic Model</b> .....	2004
<i>Garelick, Melvin</i>	
<b>High Fidelity Simulation of Tiltrotor Aerodynamic Interference</b> .....	2022
<i>He, Chengjian; Zhao, Jinggen</i>	
<b>A Methodology for Rotorcraft Brownout Mitigation Through Flight Path Optimization</b> .....	2038
<i>Tritschler, John; Celi, Roberto; Leishman, J. Gordon</i>	
<b>Off-Axis Dynamics and Simulator Fidelity</b> .....	2058
<i>Grant, Peter; Haycock, Bruce</i>	
<b>Reducing Blade Element Model Configuration Data Requirements Using System Identification and Optimization</b> .....	2067
<i>Spira, Daniel; Myrand-Lapierre, Vincent; Soucy, Olivier</i>	
<b>The Securing Equipment Computational Utility for Response Estimation (SECURE) Toolbox</b> .....	2083
<i>McKillip Jr., Robert; Keller, Jeffrey</i>	
<b>Simulating Human Error for Perceptive and Cognitive Error Assessment</b> .....	2101
<i>Isci, Hakan; Kircali, Omer Faruk</i>	
<b>Simulation Analysis of a Flight Control Law with In-Flight Performance Optimization</b> .....	2106
<i>Ozdemir, Gurbuz; Horn, Joseph F.</i>	
<b>Subjective Fidelity Assessment of Rotorcraft Training Simulators</b> .....	2118
<i>Timson, Emma; White, Mark; Perfect, Philip; Padfield, Gareth; Erdos, Robert; Gubbels, Arthur</i>	

## **OPERATIONS**

<b>Adaptive Workspace: A Technical Solution for Managing Aviation Operations</b> .....	2134
<i>Muhammad, Samad; Statkevicius, Joel</i>	
<b>Aircraft Survivability Advances Against Hard to Detect Small Arms, RPG and MANPADS Threats</b> .....	2145
<i>Deas, Torrey</i>	
<b>Commercial Derivative Rotorcraft for Select DOD Missions – A Vulnerability Perspective</b> .....	2149
<i>Schuck, Michael J.</i>	
<b>Employment of Conceptual Civil Tiltrotor Aircraft in Disaster Response</b> .....	2155
<i>Gibson, Terry L.; Jagielski, Michael; Barber, John; Chung, William; Young, Larry</i>	
<b>Flight Test Results NH90 NFH Helicopter-Ship Qualification Process</b> .....	2177
<i>Hoencamp, Alrik; Pavel, Marilena D.</i>	
<b>Hostile Fire Detection for Parapublic Operations</b> .....	2189
<i>Shepard, Charles; Williams, Randy; McNelis, Barney; Paturzo, Mike</i>	
<b>Improving Flight Safety with an Automated Analysis of Pilot Performance during Helicopter Approaches to Landing</b> .....	2203
<i>Nguyen, Phong H.; Walker, Joel; Bacht, David</i>	
<b>MQ-8B Fire Scout Vertical Lift UAS Operations in Afghanistan</b> .....	2212
<i>Parisher, Terry</i>	
<b>Operational Relevance of the Link16 Datalink to AH-64 Apache</b> .....	2218
<i>Leong, Michael</i>	
<b>WAAS-Enabled IFR Decelerating Approaches for Helicopters</b> .....	2227
<i>Wilson, Paul; Silvester, Jonathan; Griffith, Carl</i>	

## **PAVEL, MARILENA D.**

<b>A Retrospective Survey of Adverse Rotorcraft Pilot Couplings in European Perspective</b> .....	2238
<i>Malecki, Jacek; Dangvu, Binh; Masarati, Pieragnelo; Gennaretti, Massimi; Jump, Micheal; Smali, Hafid; Ionita, Achim; Zaicek, Larisa; Pavel, Marilena D.</i>	



## **PRODUCT SUPPORT SYSTEMS TECHNOLOGY**

<b>Building Commonality Across the US Army Black Hawk Integrated Vehicle Health Management System IVHMS Fleet and Reducing Data File Size</b> .....	2252
<i>Morris, Al; Russell, Danny; Hodgen, Ron; Stell, Bill; Kerns, Jennifer; Carter, Casey</i>	
<b>Comparison of an Inductance In-Line Oil Debris Sensor and Magnetic Plug Oil Debris Sensor</b> .....	2266
<i>Dempsey, Paula J.; Tuck, Roger; Showalter, Stephen</i>	
<b>Laser Powder Deposition Repair of Knife Edge (Labyrinth) Seals on Navy and Army Jet Engines</b> .....	2278
<i>Anneler, Paul</i>	
<b>A New Approach to Helicopter Maintenance Development</b> .....	2281
<i>Jenkins, Brian</i>	
<b>Numerical Approaches to Flight Reduction for Helicopter Rotor Track and Balance</b> .....	2289
<i>Pollard, Steve; Hunt, Richard; Morrish, Peter; Lieven, Nicholas</i>	

## **PROPULSION**

<b>Assessment of the Engine Installation Performance of a Redesigned Tiltrotor Intake System</b> .....	2306
<i>Garavello, Andrea; Nibale, Tommaso; Benini, Ernesto; Miste, G.</i>	

## **VOLUME 4**

<b>Benefits of Virtual Testing for Drive System Development</b> .....	2319
<i>Mermoz, Emmanuel</i>	
<b>Bicoherence Analysis for Condition Assessment of Multi-Faulted Helicopter Drivetrain Systems</b> .....	2326
<i>Hassan, Mohammed A.; Coats, David; Shin, Yong-June; Bayoumi, Abdel; Barry, Alexander</i>	
<b>Design of a Partially Distributed Turbo-Shaft Engine Control System</b> .....	2332
<i>Yedavalli, Rama; Paluszewski, Paul; Storey, William; Greene, William; Belapurkar, Rohit</i>	
<b>Feasibility Study of Oil-Free T700 Rotorcraft Engine: Hybrid Foil Bearing and Nonlinear Rotordynamics</b> .....	2341
<i>Varrey, Mahesh; Kim, Daejong</i>	
<b>Full Field Deformation Measurement Techniques for a Rotating Composite Shaft</b> .....	2350
<i>Kohlman, Lee W.; Ruggeri, Charles; Martin, Richard; Roberts, Gary; Handschuh, Robert; Roth, Don</i>	
<b>Hybrid Gear Preliminary Results - Application of Composites to Dynamic Mechanical Components</b> .....	2356
<i>Handschuh, Robert; Roberts, Gary; Sinnamon, Ryan; Stringer, David; Dykas, Brian; Kohlman, Lee</i>	
<b>Impact of Lubrication Analysis on Improvement of AH-64D Helicopter Component Performance</b> .....	2367
<i>Bayoumi, Adbel; McKenzie, Amber; Gouda, Kareem; McVay, Jacob; Carr, Damian</i>	
<b>A Method to Integrate Drive System Design</b> .....	2377
<i>Zender, Fabian; Sirojvisuth, Apinut; Schrage, Daniel; Ashok, Sylvester</i>	
<b>Preliminary Assessment of Variable Speed Power Turbine Technology on Civil Tiltrotor Size and Performance</b> .....	2391
<i>Snyder, Christopher A.; Acree, C. W., Jr.</i>	
<b>Recent Developments to Apply New High-Performance Ferrium® Steels to Lighter, More Robust Rotorcraft</b> .....	2404
<i>Sebastian, Jason; Wright, Jim; Kern, Chris; Kooy, Rich; Grabowski, Jeff</i>	
<b>Rotordynamic Feasibility of a Conceptual Variable-Speed Power Turbine Propulsion System for Large Civil Tilt-Rotor Applications</b> .....	2410
<i>Howard, Samuel</i>	
<b>Torsional Stability of a Face-Gear Drive System</b> .....	2425
<i>Peng, Meng; Desmidt, Hans A.</i>	
<b>Variable-Speed Power-Turbine Research at Glenn Research Center</b> .....	2436
<i>Welch, Gerard E.; McVetta, Ashlie; Stevens, Mark; Howard, Samuel; Giel, Paul; Ameri, Ali; To, Wai-Ming; Skoch, Gary; Thurman, Douglas R.</i>	

## **STRUCTURES & MATERIALS**

<b>Apache AH Mk1 ODR</b> .....	2454
<i>Christ, Richard; Redman, Roger; Hitchcock, Eric</i>	
<b>Assessing Sustained Fatigue Damage in Traditionally-Benign Steady-State Helicopter Flight Conditions</b> .....	2459
<i>Benton, Robert E., Jr.; Hardman, Jeremiah; Chang, Jung-Hua</i>	
<b>Common Local Instabilities of Composite Sandwich Structures with Honeycomb Cores</b> .....	2466
<i>Engleder, Alexander; Rapp, Helmut; Strobel, Dominik</i>	
<b>Comparing Alternative Helicopter Fatigue Reliability Models</b> .....	2473
<i>Kiser, Michael; Benton Jr., Robert E.</i>	
<b>Competing Failure Risk Assessment</b> .....	2482
<i>Moon, Suresh; Phan, Nam</i>	
<b>Design of an Apparatus and Method for Testing Bend-Twist Coupled Laminated Composites</b> .....	2494
<i>Armanios, Erian; Tan, Xinyuan; Haynes, Robert; Tadros, Michael</i>	
<b>Effect of High Temperature Coatings on Rotor Blade Residual Stress</b> .....	2500
<i>Nguyen, Dean; Centolanza, Louis; Nardi, Aaron; Butler, Shaolu; Kumar, Rajesh; Clavette, Pat</i>	
<b>Ice Phobic Coatings on Controlled and Covered Surfaces</b> .....	2514
<i>Burkett, Brian</i>	

<b>Modeling and Assessment of Skin/Core Debonding in Composite Rotor Blades</b> .....	2519
<i>Kumar, Rajesh; Gurvich, Mark; Wang, Xuemei; Cappelli, Marcus; Urban, Michael</i>	
<b>Numerical Analysis of Inflatable Structures with Application to Unmanned Aerial Vehicles</b> .....	2532
<i>Coatney, Michael; Haile, Mulugeta; Edge, Harris; Le, Dy; Murugan, Muthuvel</i>	
<b>OH-58 Tailboom Damage Detection Study</b> .....	2542
<i>Conlon, Stephen C.; Evans, Samuel; Smith, Edward; Romano, Peter; Barnard, Andrew</i>	
<b>Probabilistic Damage Tolerance Analysis of Debonded Sandwich Composites</b> .....	2556
<i>Shia, Micheal; Chen, Tzi-Kang; Le, Dy</i>	
<b>Qualification and Deployment of a Portable Shot Peening System for the Repair of Critical Safety Items in the Army Aviation Repair Facilities</b> .....	2564
<i>Buckner, Randy; Tegtmeyer, Jon; Chang, Jung-Hua; Liu, George; Kane, Michael; Gran, John</i>	
<b>Residual Stress Effects on Surface Crack Growth of Rotorcraft Dynamic Components</b> .....	2577
<i>Green, W. Paul; Li, Xiaoming; Krasnowski, Bogdan Roman</i>	
<b>Service Damage Assessment of Composite Rotorcraft Blades: A Methodology to Predict Internal Damage from Surface Dents</b> .....	2585
<i>Kumar, Rajesh S.; Gurvich, Mark R.; Cappelli, Marcus D.; Urban, Michael R.</i>	
<b>Statistical Review of Equivalent Initial Flaw Size Trends in 7075-T6 and Ti-6Al/4V</b> .....	2593
<i>Gould, Stephen; Mancher, Joshua; Wang, Jinlu; Urban, M.</i>	
<b>Structural Methods to Account for Porosity/Voids in Composites</b> .....	2603
<i>Nikishkov, Yuri; Airoidi, Luca; Seon, Guillaume; Makeev, Andrew</i>	

## **SYSTEMS ENGINEERING**

<b>Eurocopter Common Cockpit Avionics Concept and Its Deployment on Ec175 and Ec145 T2 (HELIONIX®) Architecture &amp; Do297 Process Highlight</b> .....	2609
<i>Guillanton, Erwan; Reich, Alexander; Germanetti, Serge</i>	
<b>An Improved QFD Method for Common Avionics System Demands Analysis</b> .....	2621
<i>Zhang, Lei; Song, Jingjing; Wu, Zhe; Zhu, Ming</i>	
<b>Integrated Product/Process Development Approach For Balancing Technology Push and Pull Between the User and Developer</b> .....	2627
<i>Schrage, Daniel P.; McCandless, William</i>	
<b>Leading Teams for Successful Clean Sheet Programs</b> .....	2652
<i>Manninen, Mike; Tiedeman, Harold; Lewis, Jonathan</i>	
<b>Mission Effectiveness and Productivity Measures - a Value Proposition for Military Rotorcraft</b> .....	2663
<i>Lloyd, John; Russell, Paul</i>	
<b>Modeling and Simulation Retrospective in Avionic System Engineering</b> .....	2674
<i>Blanrue, Ronald</i>	
<b>Motivating System Engineers</b> .....	2685
<i>Saunders, Theodora</i>	
<b>Rotorcraft and System Engineer: A New Perspective for Education and Profession</b> .....	2691
<i>Correa De Sa, Jose Antonio Guimaraes; De Andrade, Donizeti; Fraga, Valderez F.</i>	
<b>Rotorcraft Service System Design</b> .....	2698
<i>Correa De Sa, Jose Antonio Guimaraes; De Andrade, Donizeti; Fraga, Valderez F.</i>	
<b>System Engineering and Design for Environment and Safety (DFES)</b> .....	2703
<i>Saunders, Theodora; Cotoir, Grace</i>	
<b>System Requirements Decomposition and Allocation: Achieving Satisfactory R&amp;M</b> .....	2714
<i>Pham, Loan; Saunders, Theodora</i>	
<b>Systems Engineering Application for Rotorcraft Systems</b> .....	2722
<i>Sitirojvisuth, Apinut; Schrage, Daniel; Ashok, Sylvester</i>	
<b>Systems Engineering Evolution in Rotorcraft Industry</b> .....	2740
<i>Schrage, Daniel; Saunders, Theodora</i>	

## **TEST & EVALUATION**

<b>ALLFlight: A Full Scale Pilot Assistance Test Environment</b> .....	2756
<i>Lantzsch, Robin; Greiser, Steffen; Wolfram, Jens; Wartmann, Johannes; Müllhäuser, Mario; Lüken, Thomas; Döhler, Hans-Ullrich; Peinecke, Niklas</i>	
<b>Blade Displacement Measurement Technique Applied to a Full-Scale Rotor Test</b> .....	2771
<i>Abrego, Anita I.; Olson, Lawrence E.; Romander, Ethan A.; Barrows, Danny A.; Burner, Alpheus W.</i>	
<b>Blade Tip Pressure Measurements Using Pressure Sensitive Paint</b> .....	2795
<i>Wong, Oliver D.; Watkins, A. Neal; Goodman, Kyle; Crafton, Jim; Forlines, Alan; Goss, Larry; Gregory, James; Juliano, Thomas</i>	
<b>CH-47 Helicopter Swashplate Test Stand</b> .....	2809
<i>Bowman, Daniel R.; Fuchs, Steve; Thompson, Bryan</i>	
<b>Collective Limit Characterization of the Ch-53D Helicopter</b> .....	2820
<i>Neubert, Fred; Gaines, Casey; Perez, Emanuel</i>	
<b>The Development and Hover Test Application of a Projection Moiré Interferometry Blade Displacement Measurement System</b> .....	2830
<i>Sekula, Martin</i>	

<b>Evaluation of Wind Tunnel and Scaling Effects with the UH-60A Airloads Rotor .....</b>	<b>2845</b>
<i>Peterson, Randall; Maier, Thomas; Yeo, Hyeonsoo; Norman, Thomas</i>	
<b>Experimental Study of Rotor Performance in Deep Ground Effect with Application to a Human-Powered Helicopter .....</b>	<b>2876</b>
<i>Schmaus, Joseph; Berry, Benjamin; Gross, William; Koliais, Panagiotis</i>	
<b>Flight Test Evaluation of Cifer®, Conduit, and NRC Nonlinear Math Models .....</b>	<b>2889</b>
<i>Shue, Jack; Schillings, John; Wilson, Paul</i>	
<b>Hydromechanical Analysis of a Fluid-Elastic Lag Damper Incorporating Temperature Dependence from -30°C to 50°C .....</b>	<b>2904</b>
<i>Ngatu, Grum T.; Singh, Harinder J.; Wereley, Norman M.; Kothera, Curt S.</i>	
<b>Measurement of Ship Air Wake Impact on a Remotely Piloted Aerial Vehicle .....</b>	<b>2916</b>
<i>Snyder, Murray; Burks, John; Kang, Hyung; Metzger, Jason</i>	
<b>Prediction and Measurement of the Deformations of an Extremely Flexible Rotor Using Digital Image Correlation .....</b>	<b>2925</b>
<i>Sicard, Jérôme; Sirohi, Jayant</i>	

## **UNMANNED VTOL AIRCRAFT & ROTORCRAFT**

<b>Autonomous Control and Path Planning for Autorotation of Unmanned Helicopters .....</b>	<b>2941</b>
<i>Yomchinda, Thanan; Horn, Joseph; Langelaan, Jacob</i>	
<b>Characterization of a Millimeter-Scale Flapping Wing Driven by Two Orthogonally Oriented PZT Actuators .....</b>	<b>2956</b>
<i>Kroninger, Christopher M.; Pulskamp, Jeffery; Polcawich, Ronald; Smith, Gabriel</i>	
<b>Control System Development and Flight Testing of the Tiger Moth UAV .....</b>	<b>2973</b>
<i>Fujizawa, Brian T.; Tischler, Mark; Arlton, Paul; Arlton, Dave</i>	
<b>Development and Flight Testing of Flight Control Laws for Autonomous Operations Research on the RASCAL JUH-60A .....</b>	<b>2984</b>
<i>Takahashi, Marc D.; Whalley, Matthew; Fletcher, Jay; Moralez, Ernesto; Ott, Carl; Schulein, Gregory; Goerzen, Chad</i>	
<b>Evaluation of the ARTIS Sampling-Based Path Planner Using an Obstacle Field Navigation Benchmark .....</b>	<b>3008</b>
<i>Florian-Michael, Adolf; Dittrich, Joerg S.</i>	
<b>Highly Accurate SLAM for Rotary Wing MAVs .....</b>	<b>3019</b>
<i>Chopra, Inderjit; Rand, Omri; Friedman, Chen</i>	
<b>An Integrated Framework for Adaptive Optimal Obstacle Avoidance for Rotary-Wing UAVs .....</b>	<b>3029</b>
<i>Kang, Kerryun; Prasad, J. V. R; Johnson, Eric</i>	
<b>The ONERA RESSAC Unmanned Helicopter : Towards a Safe Autonomous Operation in an Urban Environment .....</b>	<b>3041</b>
<i>Watanabe, Yoko; Chavent, Paul; Piquereau, Alain; Fabiani, Patrick; Sanfourche, Martial</i>	
<b>Risk Control in Tiltrotor UAV Development .....</b>	<b>3051</b>
<i>Kang, Youngshin; Lee, Myeong-Kyu; Ahn, Osung; Choi, Seongwook; Koo, Samok; Kim, Jai Moo</i>	
<b>Stringent Safety Design and Verification Methods for VTOL Unmanned Aerial Vehicles .....</b>	<b>3057</b>
<i>Cherepinsky, Igor; Pinto, Alessandro</i>	
<b>Targeted Autonomous Indoor Flight of a Rotary-Wing MAV .....</b>	<b>3062</b>
<i>Potyagaylo, Svetlana; Rand, Omri; Kanza, Yaron</i>	
<b>Weaponization Challenges for the MQ-8B VTUAV (Fire Scout) System .....</b>	<b>3075</b>
<i>Tavares, Ernest; Mellies, Thomas; Moore, Jeremy; Sehgal, Ajay</i>	
<b>Author Index</b>	