

Dynamics Specialists

Papers Presented at the AIAA SciTech Forum and
Exposition 2019

San Diego, California, USA
7 - 11 January 2019

ISBN: 978-1-5108-8408-3

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.

The contents of this work are copyrighted and additional reproduction in whole or in part are expressly prohibited without the prior written permission of the Publisher or copyright holder. The resale of the entire proceeding as received from CURRAN is permitted.

For reprint permission, please contact AIAA's Business Manager, Technical Papers. Contact by phone at 703-264-7500; fax at 703-264-7551 or by mail at 34922 Uwytkug'Xcmg{'Ftkxg.'Uwky'422, Reston, VA 20191, USA.

TABLE OF CONTENTS

Application of Modal Truncation Vectors to the Mixed and Fixed Boundary Dynamic Math Models	1
<i>Paul A. Blelloch, John Dickens, Arya Majed, Joel Sills</i>	
Modeling of Laminated Reinforced Composite with Carbon Nanotube Interlayers to Estimate Structural Damping in a Rotorcraft Blade.....	18
<i>Keerti Prakash, Edward C. Smith, Charles Bakis</i>	
The Vibratory Control Moment Gyroscope, a New Anti-Vibration Actuator	32
<i>William A. Welsh</i>	
S-97 Raider Rotor Vibratory Loads Analysis using CFD-CSD	43
<i>Jinggen Zhao, Mikel Brigley, Ramin Modarres</i>	
Simulation of Maritime Helicopter Dynamics During Approach to Landing With Time-Accurate Wind-Over-Deck.....	58
<i>Abhinav Sharma, Jiayang Xu, Ashwani K. Padthe, Peretz P. Friedmann, Karthik Duraisamy</i>	
Aeroelastic Verification of a Dynamic Aerothermoelastic Analysis Framework	81
<i>Joe Schoneman</i>	
A Surrogate-Based Optimization Framework for Hypersonic Aerothermoelastic Scaling Laws with Application to Skin Panels	98
<i>Daning Huang, Peretz P. Friedmann</i>	
Optimization of Tiltrotor Blade Twist to Increase Whirl-Flutter Stability	125
<i>Vincenzo Muscarello, Giuseppe Quaranta</i>	
Drive Train Modeling Effects on Tiltrotor Aeroelastic Analysis	140
<i>Alberto Rigo, Vincenzo Muscarello, Pierangelo Masarati, Giuseppe Quaranta, Marco Favale</i>	
Wing Extension Design and Tailoring for a Scaled Tiltrotor Wind Tunnel Model	150
<i>Jianhua Zhang, Hao Kang, Edward C. Smith</i>	
Preparation for a Wind Tunnel Demonstration of a Pure-Electric, Swashplateless Individual Blade Control System for a High Speed Rotor	162
<i>Uwe Arnold, Thomas Auspitzer, Daniel Fuerst, Christopher Sutton, Preston Bates</i>	
Achieving Automated Rotor Track and Balance through use of Active Trim Tab and Pitch Control Rod Technologies	181
<i>Patrick Reilly, Joseph Roucken, Jeremy Sheldon, Joseph Szefi, Thomas Auspitzer</i>	
Investigation of the Nonlinear Interaction of a Flutter/Limit Cycle Oscillation of a Cantilevered Wing with a Gust Excitation	195
<i>Earl H. Dowell, Jalen Doherty, Mahendra Joshi, Mayank Sharma, Robert Kielb, Marco Rauseo, Dani Levin</i>	
Testing of Folding Wing-Tip for Gust Load Alleviation in High Aspect Ratio Wing.....	213
<i>Ronald C. Cheung, Djamel Rezgui, Jonathan E. Cooper, Thomas Wilson</i>	
Fundamental Understanding of Propeller Whirl Flutter Through Multibody Dynamics.....	229
<i>Christian B. Hoover, Jinwei Shen</i>	
Utilizing Analytic and Direct Methods for the Verification and Validation of Whirl Flutter Analyses	242
<i>Nicolas Reveles, Joseph Schoneman, Cory Rupp, Eric Blades</i>	
Transient CFD/CSD Tiltrotor Stability Analysis	256
<i>Ethan Corle, Matthew Floros, Sven Schmitz</i>	
Development of a New Aeroelastic Tiltrotor Wind Tunnel Testbed	268
<i>Andrew R. Kreshock, Cecil W. Acree, Hao Kang, Hyeonsoo Yeo</i>	
Aeroelastic Stability Analysis of a Full-Scale Isolated Proprotor on the Tiltrotor Test Rig.....	282
<i>Sesi B. Kottapalli, Carl R. Russell, Cecil W. Acree, Thomas R. Norman</i>	
Soft-Inplane Tiltrotor Aeromechanics Analysis using RCAS	306
<i>Hao Kang, Rajneesh Singh, Jinwei Shen</i>	
Design of A New Tilt Rotor Test Facility at the University of Maryland.....	316
<i>Frederick Tsai, Anubhav Datta, James Sutherland-Foggio</i>	
Author Index	