

# **AIAA Flight Testing Conference 2018**

Held at the AIAA Aviation Forum 2018

Atlanta, Georgia, USA  
25 - 29 June 2018

ISBN: 978-1-5108-6897-7

**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

## **FT-01: FLIGHT TESTING EDUCATION AND TRAINING**

|  |    |
|--|----|
| <b>The Evolution of the USAF Test Pilot School Education Paradigm Toward a Systems-Engineering Foundation (AIAA 2018-2919)</b> ..... | 1  |
| <i>Dan Montes, Tom Hill, Jeremy Cookson, George Cannon</i>   |    |
| <b>Best Practices for Training the Structures Flight Test Engineer (AIAA 2018-2920)</b> .....  | 13 |
| <i>Wendy N. Hashii, Randolph C. Thompson</i>   |    |
| <b>Software Used to Aid in Flight Sciences Education at the USAF Test Pilot School (AIAA 2018-2921)</b> .....                        | 23 |
| <i>M Christopher Cotting, David G. Mitchell, Richard A. Ruff, Sarah Dagen</i>  |    |
| <b>Stall Characteristics and Trim Changes of Six General Aviation Aircraft (AIAA 2018-2922)</b> .....                                | 39 |
| <i>Brian A. Kish, Markus Wilde, Ralph Kimberlin, Isaac Silver, Ed Kolano, Ross Schaller, David Sizoo, David Webber</i>               |    |

## **FT-02/ATIO.TF-06: FLIGHT TEST TECHNOLOGIES FROM 150KTS TO 1000KTS**

|  |    |
|--|----|
| <b>X-57 Modification 2 Motor Thermal Analysis (AIAA 2018-3410)</b> .....   | 54 |
| <i>Jeff Chin, Thomas Talerico, Andrew Smith</i>  |    |
| <b>Initial Flight Testing of an eXternal Vision System (XVS) for the Low Boom Flight Demonstrator (LBFD) (AIAA 2018-3411)</b> .....                      | 69 |
| <i>Lynda J. Kramer, Steven Williams, Trey Arthur, Randall Bailey, Kevin Shelton, Kurt Severance, Kemper Kibler</i>                                       |    |
| <b>An Overview of Lessons Learned from Sonic Boom Flight Research Projects Conducted by NASA Armstrong Flight Research Center (AIAA 2018-3412)</b> ..... | 84 |
| <i>Erin Waggoner, Larry J. Cliatt, Michael A. Hill, Edward A. Haering</i>  |    |

## **FT-06: GENERAL FLIGHT TESTING**

|  |     |
|--|-----|
| <b>Improved Altitude Hold and Hover Stabilization System Flight Testing on the United States Air Force HH-60G Helicopter (AIAA 2018-4169)</b> .....    | 102 |
| <i>Donald Koeniguer, Derek Spear</i>   |     |
| <b>The Application of FAA Handling Qualities Rating Method for Certification of Transport Category Airplane System Failures (AIAA 2018-4170)</b> ..... | 117 |
| <i>Karen W. Alberghini, Brian P. Lee</i>   |     |
| <b>Transport Aircraft Certification Testing for Pilot Closed Loop Dynamic Instability (AIAA 2018-4171)</b> .....                                       | 140 |
| <i>Brian P. Lee, Kirk A. Vining</i>  |     |

## **FT-07: FLIGHT TESTING UNMANNED AIRCRAFT SYSTEMS**

|  |     |
|--|-----|
| <b>Automatic Take-off and Landing on the Maiden Flight of a Novel Fixed-Wing UAV (AIAA 2018-4275)</b> .....  | 161 |
| <i>Martin E. Kügler, Matthias Heller, Florian Holzapfel</i>  |     |
| <b>In-flight Verification of a Model-based Designed Ground Controller for an Innovative Unmanned Air Vehicle (UAV) (AIAA 2018-4276)</b> .....                        | 173 |
| <i>David Seiferth, Martin E. Kügler, Matthias Heller</i>   |     |
| <b>Development of the UH-1 Autonomy Testbed: A Robust Testbed for Autonomy Research (AIAA 2018-4277)</b> .....   | 185 |
| <i>Fritz Langford, Jason Fine, Andrew Hopkins</i>  |     |
| <b>Design and Flight Tests of Fixed Wing UAS With Embedded Sensors, and Custom DAQ Hardware for Long Term Monitoring of Structural Health (AIAA 2018-4278)</b> ..... | 195 |
| <i>Srikanth Gururajan, Kyle Mitchell, Matthew Dreyer, Jeremy Glowacki</i>  |     |
| <b>Validation and Verification Flight Testing of UAS Morphing Potential Field Collision Avoidance Algorithms (AIAA 2018-4279)</b> .....                              | 206 |
| <i>Daksh Skukla, A R. Kim, Aaron T. Blevins, Shawn S. Keshmiri, Mark Ewing</i>   |     |

|  |     |
|--|-----|
| <b>Validation and Verification Flight Tests of Fixed-Wing Collaborative UASs with High Speeds and High Inertias (AIAA 2018-4280)</b> ..... | 216 |
| <i>Aaron T. Blevins, A R. Kim, Daksh Shukla, Shawn S. Keshmiri, Weizhang Huang</i>   |     |
| <b>Detecting, Tracking, and Localizing a Moving Quadcopter Using Two External Cameras (AIAA 2018-4281)</b> .....                           | 230 |
| <i>Matt S. Dreyer, Srikanth Gururajan, Sugandh Raj, Jeremy Glowacki</i>  |     |
| <b>Author Index</b>  |     |