



Press Release

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Vertical Flight Society Announces Winner of 2023 Alfred Gessow Best Paper Award

Selected from 21 Finalists for Best Paper from Forum 79

Fairfax, Virginia — The Vertical Flight Society (VFS) announced today the winner of the Society’s prestigious Alfred Gessow Award for the best overall technical paper presented at the 79th Annual Forum and Technology Display. This year’s winning paper is from the Crew Stations sessions entitled, “Validation of a Motion Sickness Prediction Model via Flight Tests on DLR’s Bo-105 Helicopter,” by Philippe Petit of the German Aerospace Center (DLR).

Philippe Petit graduated from ETH Zürich, Switzerland, in 2014 with a master’s degree in mechanical engineering and a focus on control engineering. He has since worked in several research positions related to aircraft and missile flight dynamics and control. At DLR he works as a researcher in the field of guidance, navigation and control and is responsible for the data fusion algorithms of DLR’s experimental EC135 helicopter, the ACT/FHS. Recently, he led the internal Project SALVARE (Safe Landing and Takeoff in low Visibility for advanced Rescue Operations), developing new technologies for the DLR “Rescue Helicopter 2030” concept. Concurrently, he is pursuing his PhD at the Technische Universität Braunschweig on the influence of motion sickness on the design of flight controls of helicopters.

DLR had previously developed a motion sickness prediction model aimed at vertical lift applications. To validate this model, flight tests with a MBB Bo-105 helicopter — owned and operated by the DLR — were conducted, as reported in the winning Gessow paper, a total of 32 test subjects were flown in 16 sorties on 30-minute sinusoidal flight paths of various frequencies. The test design and implementation included the development of a suitable measurement flight instrumentation, auditory cueing systems for accurate following of the test trajectory and questionnaires for recording motion sickness during flight. The results were analyzed, showing that the previously developed motion sickness prediction model agrees well with the motion sickness observed during flight.

The selection process, which began in October 2022, was very rigorous. Out of 330+ abstracts received, technical committee chairs selected 283 papers for publication. During the Forum, the session and technical committee chairs then selected the best papers from each of the 21 technical papers to be considered for the Gessow Award. Then the Society’s Deputy Technical Directors for Aeromechanics, Vehicle Design, Vehicle Integrity, System Integration, Systems Engineering, and Operations and Product Support winnowed that number down to six finalists. Following that, the VFS Technical Director and a committee of technical experts reviewed and ranked the papers, and in that ranking, determined that the selected paper was the best of the best. All of the best papers are available for purchase in the Vertical Flight Library & Online Store (www.vtol.org/library).

The full list of all 21 Forum 79 best papers (with links):

- **Acoustics:** [Evaluation of Acoustic Propagation in Layered Media Using Wave Confinement](#), by Subhashini Chitta, John Steinhoff, Wave CPC, Inc.; Mary Houston, Analytical Mechanics, Inc.; and James H. Stephenson, U.S. Army
- **Advanced Vertical Flight** (best overall in Vehicle Design disciplines): [Development, Simulation, and Flight Testing of Damage Tolerant Control Laws for the ADAPT™ Winged-Compound Helicopter Scaled Demonstrator](#), by Samuel J. Nadell and Tom Berger, U.S. Army; and Alex DiJoseph and Eric Huang, Piasecki Aircraft Corp.

- **Aerodynamics** (best overall in Aerodynamics disciplines): [Fundamental Test of a Hovering Rotor: Comprehensive Measurements for CFD Validation](#), by Thomas R. Norman, James T. Heineck, Edward T. Schairer, Lauren N. Wagner, Gloria K. Yamauchi, Michelle Dominguez and Alex L. Sheikman, NASA Ames Research Center; Norman W. Schaeffler, NASA Langley Research Center; and Austin D. Overmeyer, Manikandan Ramasamy and Christopher C. Cameron, U.S. Army
- **Aircraft Design**: [Blade Shape Optimization of Rotors using Neural Networks](#), by Hrithwik Shalu and Bharath Govindarajan, Indian Institute of Technology Madras; Ananth Sridharan, VTOL Analytics LLC; and Rajnesh Singh, DEVCOM Army Research Laboratory
- **Avionics & Systems**: [Evaluation of an Automatic System for Cockpit Integration Testing](#), by David Frisini, Giorgia Giulianini, Marco Romano, Nicola Zonzini and Glauco Rinaldi, TXT e-Tech; and Vincenzo Taumaturgo, Leonardo Helicopters
- **Crash Safety** (best overall in Vehicle Integrity disciplines): [A Summary of Test Results from a NASA Lift + Cruise eVTOL Crash Test](#), by Justin Littell and Jacob Putnam, NASA Langley Research Center
- **Crew Stations & Human Factors** (also best overall in the Systems Integration disciplines and Gessow Best Paper): [Validation of a Motion Sickness Prediction Model via Flight Tests on DLR's Bo-105 Helicopter](#), by Philippe Petit, German Aerospace Center (DLR)
- **Dynamics**: [Wind Tunnel Testing and Aeromechanics Predictions on Slowed Mach-Scaled Thrust Compounding Rotorcraft with a Trailing Propeller](#), by Noam Kaplan, Mrinalgouda Patil, Inderjit Chopra and Anubhav Datta, University of Maryland
- **Electric VTOL**: [Fundamental Understanding of Hybrid-Electric Power](#), by Matt Arace and Anubhav Datta, University of Maryland
- **Handling Qualities**: [Piloted Simulation Evaluation of Maneuver Optimization Control for a Coaxial Compound Helicopter](#), by Joseph F. Horn and Ryan Perry, The Pennsylvania State University; Derek Bridges, Nicholas Kuhn and D. Grey Hagwood, Jr., Piasecki Aircraft Corporation; and Tom Berger and Anthony Gong, U.S. Army
- **Health and Usage Management Systems**: [Towards an Evaluation Process for Regime Recognition Approaches: Addressing Variability in Labeling Training Data](#), by Catherine Cheung and Emma Seabrook, National Research Council Canada
- **Manufacturing Tech. & Processing**: [Computational Fluid Dynamics Simulation for Additive Friction Stir Deposition of Aluminum Alloy](#), by Xuxiao Li, Manoj Rajanna and Jim Lua, Global Engineering and Materials Inc.; Alan Timmons, Gabriel Murray and Nam Phan, Naval Air Warfare Center; and Richard Eberheim, Solvus Global, LLC
- **Modeling & Simulation**: [Estimation of Probability of Exceeding SC-VTOL Performance Requirements During Automatic Landing Using Subset Simulation](#), by Christoph Krammer and Florian Holzapfel, Technical University of Munich
- **Operations** (best overall in Operations & Product Support disciplines): [Simulation-Assisted, Weather-Aware Urban Air Mobility System Planning](#), by Michael J. Yablonski, Kimley-Horn and Associates Inc.; and Alexander Klein, AvMet Applications, Inc.
- **Product Support Systems Technology**: [SmartHangars and SAE International Aircraft Charging Standards](#), by Joshua Portlock and Richard Watson, Electro.Aero Pty Ltd.
- **Propulsion**: [Full Scale Gear Tooth Bending Fatigue Tests Obtained Early in the Development of a Rotorcraft Transmission](#), by Yuriy Gmirya, Peter X. Palcic, Dave Binney, Wei Hu and Erin Carter, Sikorsky, a Lockheed Martin Company
- **Safety**: [A Comparison of Traditional and Vuichard Vortex Ring State Recovery Techniques Using On-Line Simulation](#), by Eleni Sotiropoulos-Georgiopoulos, Alexia Payan and Dimitri Mavris, Georgia Institute of Technology; and Charles Johnson, Federal Aviation Administration
- **Structures & Materials**: [Vibratory Loads/Stress Analysis and Fatigue Alleviation with Rotorcraft Comprehensive Modeling Tool](#), by Dooyong Lee and Chengjian He, Advanced Rotorcraft Technology, Inc.; and Mulugeta Haile, U.S. DEVCOM Army Research Lab
- **Systems Engineering Tools & Processes** (best overall in Systems Engineering disciplines): [System Simulation at Airbus Helicopters: From Early Validation to Formal Certification](#), by Nicolas Brisset and Andrew Duffy, Airbus Helicopters

- **Test & Evaluation:** [CH-53K Maneuvering Envelope Expansion Challenges](#), by John Rucci, Rob Pupalaiakis, Glen Knaust, Sean Maloney, Alex Faynberg, Don Ream, Steven Spoldi and Rich Lamb, Sikorsky Aircraft, a Lockheed Martin Co.; and Laura Slingerland and Kenneth Cahill, Naval Air Systems Command
- **Unmanned VTOL:** [Intelligent Wind Estimation for Chemical Source Localization](#), by Jared Cooper and Michael DeVore, Barron Associates, Inc.; Jeremy Hopwood and Craig Woolsey, Virginia Tech.; and Stephan DeWekker, University of Virginia

In addition, the **History Committee** recognized [Operation Ivory Soap and the Largest Helicopter Rescue of WWII](#), by Paul J. Fardink, US Army (Ret.), as the winner of the Bernard Lindenbaum Best Historical Paper.

Forum 79 was held May 16-18, 2023, in West Palm Beach, Florida. Forum 80 is scheduled for May 7-9, 2024, in Montreal, Quebec, Canada. Mr. Petit will present the winning Alfred Gessow paper at the 49th Annual European Rotorcraft Forum (ERF), taking place Sept. 5-7, 2023, in Bückeburg, Germany.

Founded in 1943 as the American Helicopter Society, the Vertical Flight Society today is the international professional organization that advocates, promotes and supports vertical flight technology. For more than 80 years, the Society has provided global leadership for the advancement of vertical flight.

VFS is @VTOLsociety on social media: [Facebook](#), [Instagram](#), [LinkedIn](#), [Mastodon](#), [TikTok](#), [Threads](#), [Twitter](#), [Vimeo](#) and [YouTube](#), and also has @ElectricVTOL channels on [Facebook](#), [Mastodon](#) and [Twitter](#).

The Vertical Flight Society

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