Michael J Belisle

Redondo Beach, California
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Research interests

Aircraft drag reduction using swept-wing laminar flow control
Computations and experiments on boundary-layer stability and transition to turbulence
Flight and wind tunnel test design, execution, and analysis

Education

PhD in Aerospace Engineering · Texas A&M University · Dec 2013
Dissertation · Aerodynamic design for swept-wing laminar flow
Advisor · WS Saric

MS in Aerospace Engineering · Arizona State University · Dec 2007
Thesis · Experiments on mode competition in temporally-modulated Taylor–Couette flow
Advisors · WS Saric and JM Lopez

BSE in Aerospace Engineering · Arizona State University · Dec 2005
Thesis · Temporal behavior of modulated Taylor–Couette flow
Advisor · WS Saric

Research and teaching experience

Texas A&M University, College Station, Texas · Aug 2007–Jul 2012

Graduate Assistant Research · Flight Research Laboratory, Aerospace Engineering
Supervisor · WS Saric
Designed and analyzed boundary-layer stability of a wing glove for in-flight demonstration of laminar-flow on a Gulfstream III aircraft; contributed to the development of a laminar flow health monitoring system concept; expanded data acquisition system for aircraft dynamic maneuver measurements in a flight testing course; supported flight-test experiments; administered computational workstations.

Arizona State University, Tempe, Arizona · May 2003–Aug 2007

Graduate Research Assistant · Mathematics and Statistics · May–Aug 2007
Supervisor · JM Lopez
Conducted Taylor–Couette experiments in support of MS thesis, including writing instrument control, data acquisition, quantitative image analysis programs.

Graduate Teaching Assistant · Mechanical and Aerospace Engineering · Sept 2006–May 2007
Supervisor · KD Squires
Administered laboratory experiments in senior-level mechanical engineering course.

Undergraduate Research Assistant · Mathematics and Statistics · Oct–Dec 2005
Supervisor · JM Lopez
Resurrected large-scale Taylor–Couette experimental apparatus and conducted preliminary experiments in support of undergraduate thesis.

Undergraduate Research Assistant · Wind Tunnel Complex, Mech. and Aerospace Engineering · May 2003–May 2005
Supervisor · WS Saric
Supported wind tunnel experiments, including hot-wire/hot-film anemometry and infrared thermography; created and maintained group website.

von Karman Institute, Rhode-Saint-Genèse, Belgium · May–Aug 2005

Stagaire, Aeronautics and Aerospace
Supervisor · H Deconinck
Validated THOR CFD code using airfoil pressure measurements from a transonic wind tunnel test.

Technical skills and experience

Computational and theoretical methods · Multidisciplinary design of laminar-flow airfoils for natural laminar flow (NLF) and passive laminar flow control (LFC) using spanwise-periodic discrete roughness elements (DRE); analysis of laminar–turbulent transition in boundary layers using linear stability theory (LST), linear and nonlinear parabolized stability equations (LPSE, NPSE); finite-difference solutions of partial differential equations; iterative and constrained optimization design methods; meanflow and direct-boundary-layer (DBL) solutions; analysis code scripting and input/output interfacing

Experimental methods · Experimental data acquisition and processing, including hotwire/hotfilm anemometry, pressure measurements, infrared thermography; flight test and wind tunnel test design of experiments (DOE); image processing, spectral analysis, and other data reduction techniques

Flight and wind tunnel test experience · Participated in wind tunnel tests at NASA Ames 11-Foot Transonic Unitary Plan Wind Tunnel, NASA Langley 4-Foot Supersonic Unitary Plan Wind Tunnel, and Illinois Institute of Technology National Diagnostic Facility; flight tests on Cessna O-2A aircraft at Texas A&M Flight Research Laboratory

Programming and other languages · Fortan 77/90/95, C, C++, Mathematica, MATLAB, LabVIEW, Python, Bourne shell scripting, awk, sed, XHTML, CSS, PHP, MySQL

CFD and boundary-layer analysis codes · LASTRAC, WINGBL2, FLUENT, GAMBIT, Q3BL, LST3D, TRANAIR++, XFOIL, Tecplot

Operating systems · System administration and utilization of various operating systems including Mac OS X, Linux (Ubuntu, Debian), IRIX, AIX, and Microsoft Windows

Other software · Microsoft Word, Powerpoint, Excel; Apple Keynote; Adobe Photoshop, Illustrator, Acrobat; SolidWorks; LaTeX

Publications

Hartshorn F, Belisle MJ, and Reed HL. 2012. Computational Optimization of a Natural Laminar Flow Experimental Wing Glove. In preparation, 50th AIAA Aerospace Sciences Meeting, Nashville, Tennessee.

Belisle MJ, Roberts MW, Tufts MW, Tucker AA, Williams TC, Saric WS, and Reed HL. 2011. Design of the Subsonic Aircraft Roughness Glove Experiment (SARGE). Invited, AIAA paper 2011-3524.

Belisle MJ, Neale TP, Reed HL, and Saric WS. 2010. Design of a swept-wing laminar flow control flight experiment for transonic aircraft. AIAA paper 2010-4381.

Mavris DN, Saric WS, Ran H, Belisle MJ, Woodruff MJ, and Reed HL. 2010. Investigation of a health-monitoring methodology for future natural laminar flow transport aircraft. Invited, 27th International Congress of the Aeronautical Sciences. ICAS paper 2010-1.9.3.

Avila M, Belisle MJ, Lopez JM, Marques F, and Saric WS. 2008. Mode competition in modulated Taylor–Couette flow. J. Fluid Mech. 601:381–406.

Presentations

Belisle MJ, Saric WS, Avila M, Lopez JM, and Marques F. 2009. Mode competition in experimental modulated Taylor–Couette flow. 16th International Couette–Taylor Workshop, Princeton University.

Avila M, Belisle MJ, Lopez JM, Marques F, and Saric WS. 2007. Mode competition in modulated Taylor–Couette flow. APS 60th Annual Meeting of the Division of Fluid Dynamics, Salt Lake City, Utah.

Avila M, Belisle MJ, Lopez JM, Marques F, and Saric WS. 2007. Mode competition in slowly varying flows. 7th EUROMECH Fluid Mechanics Conference, University of Manchester, England.

Belisle MJ, Saric WS, Lopez JM, and Avila M. 2007. Mode competition between reversing and nonreversing modulated Taylor-vortex flow. 15th International Couette–Taylor Workshop, Université du Havre, France.

Belisle MJ. 2007. Temporal behavior of Taylor–Couette flow sinusoidally modulated about a zero mean. 2007 AIAA Region VI Student Conference, San Jose State University. Second place in Master's division.

Belisle MJ. 2005. Description and verification of the reconstructed Arizona State University Taylor-Vortex Generator. 2005 AIAA Region VI Student Conference, California Polytechnic State University.

Grants and fellowships

2005	NSF Research Experience for Undergraduates
2004–2005	Fulton Undergraduate Research Initiative Grant
2001–2002	National Merit Scholarship

Professional activities and leadership

Aircraft Owners and Pilots Association · Member · 2010–present

American Institute of Aeronautics and Astronautics · Member · 2003–present
Graduate Student Representative · Texas A&M University Student Branch · 2009–2010
Council Member · Phoenix Section · 2004–2005
Chair · Arizona State University Student Branch · 2004–2005

American Physical Society · Member · 2007–present

American Society of Mechanical Engineers · Member · 2002–present
Webmaster · Arizona State University Student Section · 2002–2004

Ira A. Fulton School of Engineering Student Council (Arizona State University)
Newsletter Coordinator · 2004–2005
Director of Communications · 2003–2004

National Association of Engineering Student Councils
Vice-President, Communications · West Region · 2004–2005
Vice-President, Relations · West Region · 2004

Society of Women Engineers · Member · 2003–present
Student Council Representative · Arizona State University Student Section · 2004–2005
Webmaster · Arizona State University Student Section · 2003–2004