

## **Scott C. Morris**

Aerospace and Mechanical Engineering  
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### **Education**

Doctor of Philosophy, Michigan State University, Mechanical Engineering, 2002  
Master of Science, Michigan State University, Applied Mathematics, 2001  
Master of Science, Michigan State University, Mechanical Engineering, 1997  
Bachelor of Science, Michigan State University, Mechanical Engineering, 1994

### **Professional Experience**

Assistant Professor, Department of Aerospace and Mechanical Engineering,  
University of Notre Dame, Notre Dame, IN, 2002 - present.

Graduate Research Assistant, Michigan State University, East Lansing, MI, 1994 - 2002.

### **Scholarships and Award**

2003 Summer Faculty Fellow of the Office of Naval Research  
General Motors Undergraduate Scholarship Award, 1992-1994  
2004 Young Investigator Award, Office of Naval Research  
Phi-Kappa-Phi Honor Society  
Mechanical Engineering Graduate Student of the Year, 2000

### **Professional Memberships and Activities**

#### Memberships

American Physical Society  
American Society of Engineering Education  
American Institute for Aeronautics and Astronautics

## Journal Publications

1. Morris, S.C., Stolpa, S.R., Slaboch, P.E., Klewicki, J.C., 2006, "Near surface turbulence in a smooth wall atmospheric boundary layer," *Journal of Fluid Mechanics*, in review.
2. Shannon, D., Morris, S.C., 2006, "Trailing edge flow physics with application to acoustic generation," *Experiments in Fluids*, in review.
3. Stephens, D., Morris, S.C., 2006, "A method for quantifying the acoustic transfer function of a ducted rotor" *Journal of Sound and Vibration*, in review.
4. Slaboch, P., Morris, S.C., 2006, "Measurement of unsteady force using electro-mechanical film sensors," *Experiments in Fluids*, in review.
5. Shannon, D. W., Morris, S. C., and Mueller, T. J., 2006, "Radiated Sound and Turbulent Motions in a Blunt Trailing Edge Flow Field," *International Journal of Heat and Fluid Flow*, in press.
6. Morris, S.C., Foss, J.F., 2005, "Vorticity spectra in high Reynolds number anisotropic turbulence," *Phys. Fluids*, Vol. 17, 088102.
7. A. Aksan, S.C. Morris, M. Toner, 2005, "Analysis of Desiccation and Vitrification Characteristics of Carbohydrate Films by Shear-Wave Resonators," *Langmuir*, Vol 21, pp. 2847-2854.
8. S.C. Morris, J.F. Foss, 2003, "Boundary Layer to Shear Layer - the Transition Region," *J. Fluid Mech.*, Vol. 494, pp.187-221.
9. S.C. Morris, J.F. Foss, 2003, "Transient Thermal Response of a Constant Temperature Anemometer," *Meas. Sci. Tech.*, Vol. 14, No. 3, pg. 251.
10. S.C. Morris, 2002, "Evaluation of Turbulence Statistics from Engine Fan Velocity Measurements," *SAE Transactions Journal of Passenger Cars - Mechanical Systems*, pg. 52.
11. I.S. Wichman, S.C. Morris, and A.W. McIntosh, 2002, "Experimental Measurements of Flow and Flame Spread in the Development of a Fire Testing Facility," *Experimental Thermal and Fluid Science*, Vol 25 pp595-603.
12. S.C. Morris, J.F. Foss, 2001, "An Aerodynamic Shroud: an Automotive Application," *Journal of Fluids Engineering*, vol. 123, No. 2, pp. 278-292.
13. S.C. Morris, D.R. Neal, J.F. Foss, and G.L. Cloud, 2001, "A moment-of-momentum flux mass air flow measurement device," *Measurement Science and Technology*, 12, pp. N9-N13.
14. S.C. Morris, J.J. Good, and J.F. Foss, 1998, "Velocity measurements in the wake of an automotive cooling fan," *Experimental Thermal and Fluid Science*, vol. 17, pp.100-106.

## Conference Publications

1. Douville, T., Stephens, J., Corke, T., Morris, S., "High speed turbine blade tip clearance control using plasma actuators," 44th Aerospace Sciences Meeting and Exhibit, Reno, NV, AIAA-2006-0020.
2. Cameron, J., Gendrich, C., Corke, T., Morris, S., "A transonic axial compressor facility for fundamental research and flow control development," 44th Aerospace Sciences Meeting and Exhibit, Reno, NV, AIAA-2006-0416.
3. Ma, R., Morris, S., Corke, T., "Preliminary design of a transonic research turbine facility," 44th Aerospace Sciences Meeting and Exhibit, Reno, NV, AIAA-2006-1311.
4. Van Ness, D., Corke, T., Morris, S., "Turbine tip clearance flow control using plasma actuators." 44th Aerospace Sciences Meeting and Exhibit, Reno, NV, AIAA-2006-0021.
5. D. Shannon, S.C. Morris, 2005, "Trailing Edge Flow Physics and Acoustics," *Turbulent Shear Flows Phenomenon -4*, Blacksburg, VA, June.

6. D. Shannon, S.C. Morris, 2005, "Trailing Edge Acoustics," AIAA Aeroacoustics Meeting, Monterey, CA, May, AIAA 2005-2957.
7. D. Stephens, S.C. Morris, 2005, "Acoustics of a ducted propeller," AIAA Aeroacoustics Meeting, Monterey, CA, May.
8. S.C. Morris, T.C. Corke, D. VanNess, J. Stephens, T. Douville, "Tip Clearance Control Using Plasma Actuators," 43rd AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, AIAA 2005-0782.
9. D. Shannon, S.C. Morris, 2004, "Visualization of blunt trailing edge turbulence," *11th International Symposium on Flow Visualization*, Notre Dame, IN.
10. P. Slaboch, S. Stolpa, S.C. Morris, 2004, "Spatially Resolved Near Surface Motions in the Atmospheric Boundary Layer Using PIV," *11th International Symposium on Flow Visualization*, Notre Dame, IN.
11. S.C. Morris, R. Nofke, T.J. Mueller, 2004. "The effects of inflow turbulence on propeller wake flow using Fourier and Karhunen-Loeve basis Vectors," 42nd AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, AIAA 2004-0687.
12. S.C. Morris, J.F. Foss, A. Hellum, 2003, "Velocity-Vorticity Decomposition of the Reynolds Stress Gradient in a Shear Layer," *Turbulent Shear Flows Phenomenon - 3*, Sendai, Japan.
13. J.F. Foss, S.C. Morris, 2002, "Velocity Vorticity Product in Boundary and Shear Layers," IUTAM symposium on high Reynolds numbers, Princeton, NJ.
14. S.C. Morris, J.F. Foss, 2002 "Scaling of vorticity in a shear layer," IUTAM symposium on high Reynolds numbers, Princeton, NJ.
15. S.C. Morris, (2001), "Evaluation of Turbulence Statistics From Engine Cooling Fan Velocity Measurements," SAE Vehicle Thermal Management Systems 5, paper no. 2001-01-1710, May.
16. J.F. Foss, T.J. Hicks, D. Neal, and S. Morris (1999), "Operating Experience of the Pulse Width Modulated-Constant Temperature Anemometer," AIAA 30<sup>th</sup> Fluid Dynamics Conference and Exhibit, July.
17. D.R. Neal, S.C. Treat, S.C. Morris, and J.F. Foss (1999), "Using Particle Image Velocimetry (PIV) Measurements to Evaluate Blade Designs for Axial Fans," Proceedings of the 3<sup>rd</sup> International Workshop on PIV-99, Santa Barbara, CA, pp 657-662.
18. S.C. Morris, T.J. Hicks, and J.F. Foss (1999), "Transient Thermal Response of a Constant Temperature Anemometer," Proceedings of the 3<sup>rd</sup> ASME/JSME Joint Fluids Engineering Conference, San Francisco, paper no. FEDSM99-7350.
19. N.G. Humbad, J.F. Foss, R.A. Porda, S.C. Morris, R.J. Prevost and D.G. Johnson (1998), "Noise and Flow Measurements in an Automotive Blower Scroll," ASME Noise Control and Acoustics DIV, NCA-Vol 25.
20. S.C. Morris, J.F. Foss and J.E. Pakkala (1997) "The Automotive Cooling Fan Research and Development Facility," SAE Vehicle Thermal Management Systems, paper no. 971784, May.
21. S.C. Morris and J.F. Foss (1997) "Integral Performance Measurements and Detailed Flow Field Observations for a 1994 Ford Explorer Cooling Fan," SAE Vehicle Thermal Management Systems, paper no. 971794, May.
22. S.C. Morris and J.F. Foss (1997) "The Aerodynamic Shroud: An Automotive Application," ASME/FED Summer Meeting, paper no. FEDSM97-3277, July.
23. S.C. Morris, J.J. Good, J.F. Foss, (1996) "Velocity Measurements in the Wake of an Automotive Cooling Fan," Engineering Turbulence Modeling and Experiments 3, Proceedings of the

3rd International Symposium on Engineering Turbulence Modelling and Measurements, ed. W. Rodi and G Bergeles, Heraklion-Crete, Greece, pp. 785-794, May.

### **Other Publications**

Morris, S.C., 2006, "Transverse vorticity measurements with a four sensor hot-wire probe," in *Handbook of Experimental Fluid Mechanics*, C. Tropea, ed., Springer, in press.

Foss, J.F., and Morris, S.C., "Fan Shroud with Integral Air Supply," US Patent No. 5,991.685.

### **Invited Lectures and Addresses**

"Turbulence and Aeroacoustics," Virginia Polytechnic Institute, October 2004.

"Trailing Edge Acoustics," Western Michigan University, March 2004.

"Experimental Results from a Model Ducted Propeller System," Naval Surface Warfare Center - Carderock Division, October 2003.

"Recent Advancements in Ultrasonic Technology," Harvard Medical School, March 2003.

"Theory of Inhomogeneous Turbulence," Department of Aerospace and Mechanical Engineering, University of Minnesota, February 2003.

"The Sub-shear Layer of a High Reynolds Number Separated Boundary Layer," Department of Mechanical Engineering, Purdue University, November 2001.

"Distinguishing between Cycle-to-Cycle Variations and Turbulence in Turbomachinery Measurement," NASA Glenn Research Center, April 2001.

"Transient Thermal Response of Cryogenic Hot-wires," Department of Physics, University of Oregon, March 1999.

### **Doctoral Dissertations Directed**

Joshua Cameron, "Demonstration of Active Flow Control in a Transonic Compressor," (2006)

Daniel Shannon, "Turbulence and Acoustics of Flow Near a Trailing Edge," (2007)

David Stevens, "Free field acoustics from a ducted rotor," (2008)

Anthony Costantino

Paul Slaboch

Matthew Bennington

John Schmitz

Paul Mikrut

Timothy Scobbie

## **Masters Theses Directed**

Scott Stolpa, "PIV Measurements in the Near Surface Region of an Atmospheric Boundary Layer," August 2004.

Claudia Kunze (Co-advisor) "Acoustics and Turbulence of a Trailing Edge Flow Field," March 2004.

Richard Nofke (Co-advisor), "Experimental Study of the Wake Behind a Ten-Bladed Propeller With and Without Ingested Turbulence," December 2003.

## **Undergraduate Projects Supervised**

Mark Ross, BSAE 2006, "Control of potential disturbances in rotating machinery"

Scott Manwaring, BSME 2006, "Gappy data in turbulent flows using snapshot proper orthogonal decomposition"

Anthony Domingez, BSME 2007, "Design of a cooled turbine spool"

Mike McConnel, BSAE 2007, "Phased array acoustic measurements of an optimal trailing edge"

Kevin Bricker, BSAE 2007, "A novel unsteady total pressure sensor for turbomachinery applications"

William Gallagher, BSAE 2007, "Acoustic forcing of fluid loaded elastic membranes"

Joseph Blakely, BSAE 2006, "Near Surface PIV in Water"

Mike Lisman, BSAE 2005, "Reciprocity Measurements in an Annular Duct"

Mark Ross, BSAE 2006, "Magnetic Bearing Control for Compressor Stall Control"

Mike Lisman, BSAE 2005, "Introduction to Acoustic Theory."

Kathleen Donovan, BSAE 2004, "Acoustic Levitation for Drying of Biomaterials" (currently a Ph.D. candidate, The Ohio State University).

Paul Slaboch, BSAE 2004, "The Development of an Undergraduate Laboratory II", "Numerical calculations of Duct Acoustics" and "Velocity Measurements in the Atmospheric Boundary Layer" (currently a Ph.D. candidate, Notre Dame).

Jeff Newcamp, BSAE 2004, MSAE, AFIT, "PIV Measurements in a Blunt Trailing Edge with Flow Control".

Erin Muldoon, BSAE 2004, "Materials and design for structural acoustic experiments" (currently a staff engineer at NASA, Huntsville, AL).

Jason Mayes, BSME 2003, "The Development of an Undergraduate Laboratory I" (currently a Ph.D. candidate, Notre Dame).

Dan Masse, BSME 2003, "Development of a Hot-wire Anemometry Assembly Station"