

# Biographical Sketch for William L. Roberts, PI

## Professional Preparation:

The University of Michigan, Aerospace Engineering, BSAE, 1986

The University of Michigan, Aerospace Engineering, Ph.D., 1992

## Appointments:

Associate Professor, Dept. of Mechanical and Aerospace Engineering, North Carolina State University, Raleigh, NC 1999-pres.

Assistant Professor, Dept. of Mechanical and Aerospace Engineering, North Carolina State University, Raleigh, NC 1994-1999.

Research Engineer, Lockheed Engineering and Sciences Co, NASA Langley Program Office, Hampton, VA 1992-1994.

Aerospace Engineer, Analytical Services (ANSER), Co, Arlington, VA 1987-1989.

## Publications:

*Most recent:*

1. Y. Li, W. L. Roberts, M. S. Brown, and G. C. Herring, "Transient Grating Spectroscopy with Delayed Thermalization in Non-Combusting CO/Air Mixtures," Optics Communications (accepted 19 August 2003)
2. E. J. Welle, W. L. Roberts, C. D. Carter, and J. M. Donbar, "Response of an Unsteady Counterflow Propane-Air Diffusion Flame Using Simultaneous PIV and CH/OH-PLIF Measurements," Combustion and Flame (accepted 18 June, 03)
3. A. Kodal, K. A. Watson, W. L. Roberts and K. M. Lyons, "Turbulence Filter and POD Analysis for Velocity Fields in Lifted CH<sub>4</sub>-Air Diffusion Flames," Flow, Turbulence and Combustion (accepted 7 Mar. 03)
4. B. J. Boothe, A. J. Shih, J. Kong, and W. L. Roberts, "Goniometric Characteristics of Optical Fibers for Temperature Measurement in Diesel Engine Exhaust Filters," Measurement Science and Technology Vol. 14, No. 5, pp. 563-572 (2003).
5. M. S. Brown, Y. Li, W. L. Roberts, and J. Gord, "Analysis of Transient Grating Signals for Reacting Flow Applications," Applied Optics Vol. 42, No.3 Jan 20 pp. 566-578 (2003).

*Other significant publications:*

1. Y. Xiong, and W. L. Roberts, "Observations on the Interaction between a Premixed Flame Kernel and a Vortex of Different Equivalence Ratio," Proceedings of the Combustion Institute, Vol. 29, Part 2 (2003).

2. Y. Li, W. L. Roberts, and M. S. Brown, "The Investigation of Gaseous Acoustic Damping Rates by Transient Grating Spectroscopy," AIAA Journal Vol. 40, No. 6, June (2002).
3. Y. Xiong, W. L. Roberts, M. C. Drake, and T. D. Fansler, "Investigation of Premixed Flame-Kernel/Vortex Interactions via High-Speed Imaging," Combustion and Flame Vol. 126, No. 4, pp. 1827-1844, (2001).
4. D. A. Santoianni, M. E. DeCroix, and W. L. Roberts, "Temperature Imaging in an Unsteady Propane-Air Counterflow Diffusion Flame Subjected to Low Frequency Oscillations," Flow, Turbulence and Combustion, 66 (1): 23-36 (2001).
5. E. J. Welle, W. L. Roberts, M. E. DeCroix, C. D. Carter, and J. M. Donbar, "Simultaneous PIV and OH-PLIF Measurements in an Unsteady Propane-Air Counterflow Diffusion Flame," Proceedings of the Combustion Institute, Vol. 28, pp. 2021-2027 (2000).

### **Synergistic Activities:**

Participant in NSF50: Where Discoveries Begin "Scientists and Engineers in the Schools" program. Working with Centennial Middle School as science resource for teachers and provide guest lectures on optics, aeropropulsion, and spaceflight.

Science Advisor to Fred A. Olds Elementary School; responsible for coordinating annual Discovery Day in the fall and Science Fair in the spring, acting as science resource for teachers, guest lecturer on numerous occasions.

Participant in Teacher-Scientist Alliance Program of the APS. Attended Lead-Scientist Institute for K-8 Science Education, Jan 8-12 2000 in Washington DC

Encourage participation in research by underrepresented minorities through two Research Experiences for Undergraduates grants.

### **Professional Activities:**

Combustion Institute: Member of Executive Board (Arrangements Chair, 2002-2004) for the Eastern States Section

AIAA: Senior Member, member of Propellants and Combustion Technical Committee

Sigma Gamma Tau: Faculty Advisor, 2001 – pres.

Reviewer for NSF, NASA, AFOSR, ARO, and EPA proposals. Reviewer for Comb. Flame, CST, Proc. Comb. Inst. (Vols. 25-29), Applied Optics, J. Phys. Chem, AIAA J., J. Prop. Power,

### **Collaborators and Other Affiliations:**

Collaborators: M. S. Brown, ISSI, Dayton, OH; R.-H. Chen, Univ of Cent. Fl, Orlando, FL; M. C. Drake, GMRD&P, Warren MI; T. D. Fansler, GMRD&P, Warren, MI, G. C. Herring, NASA LaRC, Hampton, VA

Graduate and Postdoctoral Advisors: J. F. Driscoll, University of Michigan

Thesis Advisor and Postgraduate-Scholar Sponsor:

Ph. D.: M. R. DeCroix (Los Alamos National Labs), Y. Li (Hypertherm, Inc), Y. Xiong (Nokia, Inc), E. J. Welle (Sandia National Labs)

MS: D. Eichenberger, C. Cataldo, C. Hsieh, D. Santionanni, E. Welle, C. DeBruhl, L. McCrain.