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Brief Biography

Dr. Chaos received a B.S. degree in Aerospace Engineering from the University of Central Florida (UCF) in 1998. At that time he was awarded the Siemens-Westinghouse Power Corporation doctoral fellowship and pursued a Ph.D. degree in Mechanical Engineering at UCF, which he received in 2003. While at UCF he applied laser diagnostics to study the properties of unsteady diffusion flames and was involved in other projects covering subjects such as energetic materials, flame emissions, flame dynamics and extinction, and acoustics; he was also a lecturer for several years. He joined Princeton's Fuels and Combustion Research Laboratory in 2005 as a postdoctoral research associate and was promoted to the Professional Staff in 2007.

Relevant Experience and Interests

Dr. Chaos' research interests are quite broad and include combustion and flame phenomena, alternative fuels, chemical kinetics, fluid dynamics, heat transfer, experimental laser and optical techniques, pollutant emissions of combustion systems, propulsion, and acoustics. Currently he is heavily involved in energy research at Princeton where he collaborates with Prof. Dryer and Prof. Ju. His research comprises both experiments and modeling of the behavior of conventional, alternative, and surrogate fuels under practical conditions. He has experience in developing and validating chemical kinetic models for large hydrocarbons as well as fundamental molecules. He has also developed in-house codes to help implement chemical kinetics in the modeling of experimental combustion systems.

Five Publications Relevant to the Present Subject Area

1. M. Chaos, Z. Zhao, A. Kazakov, P. Gokulakrishnan, M. Angioletti, and F.L. Dryer (2007). "A PRF+Toluene Surrogate Fuel Model for Simulating Gasoline Kinetics," Paper E26, 5th US Combustion Meeting, San Diego, CA, March 25-28.
2. M. Chaos, A. Kazakov, Z. Zhao, and F.L. Dryer, (2007). "A High Temperature Chemical-Kinetic Model for Primary Reference Fuels," *Int. J. Chem. Kinet.* 39, 399-414.
3. J. Li, Z. Zhao, A. Kazakov, M. Chaos, F.L. Dryer, and Scire, J.J., Jr. (2007). "A Comprehensive Kinetic Mechanism for CO, CH₂O, CH₃OH Combustion," *Int. J. Chem. Kinet.* 39, 109-136.
4. Z. Chen, X. Qin, Y. Ju, Z. Zhao, M. Chaos, and F. L. Dryer (2007). "High Temperature Ignition and Combustion Enhancement by Dimethyl Ether Addition to Methane-Air Flames," *Proc. Combust. Inst.* 31, 1215-1222.
5. A. Kazakov, M. Chaos, Z. Zhao and F.L. Dryer (2006). "Computational Singular Perturbation Analysis of Two Stage Ignition of Large Hydrocarbons," *J. Phys. Chem. A* 110, 7003-7009.

Other Selected Publications

1. M. Chaos and F.L. Dryer (2007) "Syngas Combustion Kinetics and Applications," *Combust. Sci. Tech.*, in press
2. Z. Zhao, M. Chaos, A. Kazakov, and F.L. Dryer (2007). "Thermal Decomposition Reaction and a Comprehensive Kinetic Model of Dimethyl Ether," *Int. J. Chem. Kinet.*, in press.
3. F.L. Dryer and M. Chaos (2007). "Ignition of Syngas/Air and Hydrogen/Air Mixtures at Low Temperatures and High Pressures: Experimental Data Interpretation and Kinetic Modeling Implications," *Combust. Flame*, doi:10.1016/j.combustflame.2007.08.005
4. R.-H. Chen, C. Suryanarayana, and M. Chaos (2006) "Combustion Characteristics of Mechanically Alloyed Ultrafine-Grained Al-Mg Powders," *Adv. Eng. Mater.* 8, 563-567.
5. M. Chaos, G.F. Haddad, and R.-H.Chen (2005). "Airborne Particle Detection Using Acoustic Transducers," *WIT Transactions on Ecology and the Environment* 82, 435-444.
6. M. Chaos, R.-H. Chen, E.J. Welle, and W.L. Roberts (2005). "Fuel Lewis Number Effects in Unsteady Burke-Schumann Hydrogen Flames," *Combust. Sci. Tech.* 177, 75-88.