The Department of Mechanical Engineering/College of Engineering and Applied Sciences
Stony Brook University

Mechanical Engineering Seminar

Faculty Candidate

Dr. Sotirios Mamalis
Senior Analysis Engineer at MAHLE

Lecture Title: Modeling and Experiments of Advanced Combustion Engines

Friday June 7, 2013 at 2:30PM, Room 173 Light Engineering Building

Abstract

Advanced combustion engines can provide solutions for future clean and efficient transportation. Modeling and experiments of novel combustion concepts have shown the potential for considerable gains in fuel economy with significant reduction in pollutant formation. In order to harness the potential of these engine concepts, it is critical to improve our understanding of the combustion processes and their role in advanced powertrains. This presentation will attempt to demonstrate the potential of two promising combustion concepts - gasoline compression ignition and pre-chamber gasoline spark ignition – and to outline potential future research work on these concepts. In specific, gasoline compression ignition studies using predictive combustion models will be presented, and the implications of mixture formation on ignition and combustion are discussed. Modeling of gasoline compression ignition is augmented by exergy analysis which is used to assess inefficiencies and identify potential operating strategies for optimum efficiency. The last part of the presentation will present a pre-chamber spark ignition concept by introducing CFD simulations and discussing the challenges involved in automotive applications.

Biography

Dr. Sotirios Mamalis received his Ph.D. degree in Mechanical Engineering in 2012 from the University of Michigan. His research work focused on modeling and analysis of gasoline compression ignition engines. His research interests lie in the areas of advanced powertrain systems and energy conversion. Dr. Mamalis has served as a Research Assistant in the General Motors – University of Michigan Collaborative Research Lab and as a Teaching Assistant at the University of Michigan. He is currently employed as a Sr. Analysis Engineer at MAHLE Powertrain in Detroit, MI.

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