PRISM Seminar Series – Fall 2009

Photoacoustic Spectroscopy for Trace Gas Analysis

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Internship: Lawrence Livermore National Laboratories, Livermore, CA

Friday, September 25, 2009
3:00 pm in Birck 1001

Abstract: Real time health monitoring of systems under unknown environmental conditions is needed for the United States aging nuclear stockpile. Current techniques for ascertaining the status of a nuclear warhead are costly and time consuming. A pervasive, noninvasive and “smart” sensor network that evaluates the system would provide much improved efficiency over the current diagnostic techniques. A proposed method to predict the onset of failure is to use photoacoustic spectroscopy (PAS) coupled with highly reliable microelectromechanical systems (MEMS) pressure sensors. As materials inside the missile degrade they outgas into the environment. The PAS sensor will have the ability to detect the trace gases (at concentrations of ppb-ppt), thereby serving as an early warning detection system for imminent failure. This presentation will walk through the physics, design and implementation of PAS for trace gas analysis.

Bio: Joshua Small received the B.S. degree in electrical and computer engineering from Morgan State University, Baltimore Maryland in 2005 and is currently working towards the Ph.D. in electrical and computer engineering at Purdue University, West Lafayette Indiana. His research interests include RF MEMS devices, tunable resonators, filters, matching networks and robust and reliable processing techniques and electrostatic actuation architectures for long term operation of MEMS devices and subsystems.

Refreshments will be served.
For further information please contact Asst. Prof. Alina Alexeenko, alexeenk@purdue.edu
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