SAN DIEGO STATE UNIVERSITY

Mechanical Engineering
Fall Seminar Series

Detailed Models for Fuel Combustion & Soot: From Fundamentals to Practical Simulations

Wednesday, November 8th, 2:00 pm-3:00 pm; Room E-201

Abstract:

Simulation enables rapid and cost effective development of improved designs for more efficient, cleaner engines while enabling fuel flexibility. As advanced designs are pushing engineering limits, accurate combustion and emissions chemistry is necessary both for reliable simulation predictions and for exploring new design concepts. In this seminar, elementary reaction mechanisms are presented as a predictive tool for fuel chemistry. The development and validation of reaction mechanisms for combustion of various hydrocarbons are described. Building on the combustion mechanism, a complex soot-surface chemistry is developed that captures fuel effects and provides particle size distribution.

BIO:

Chitral Naik obtained his Ph. D. in Chemical Engineering from Colorado School of Mines in 2005. Chitral is a Lead Software Developed at ANSYS and an author of over 60 journal articles and conference proceedings. He leads the Engineering Development group at ANSYS. His expertise includes reactive flow modeling using detailed chemical kinetics. As a principle developer of the Model Fuels Consortium, he advanced the state of fuel models and enabled their use in simulation of complex systems such as engines and combustors to accurately predict fuel effects on combustion and emissions. He is also a developer of the Chemkin and Forte CFD software. Early in the career, he worked at an energy consulting firm and developed predictive software for heavy metal emissions from utility gas-cleaning systems.

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