



IEEE

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Fort Wayne Section Technical Meeting

Social Hour & Pizza: 6:00PM-6:30PM

Tuesday, June 3, 2014, 6:30PM-8:05PM

Meeting Location

IPFW Engineering & Technology Building – Room ET 346

Please go the Ft Wayne Section web site to register for the event:

https://purdue.qualtrics.com/SE/?SID=SV_1SNqMwH2MLJ3LaR or

Email Reservation to: Dr. Gouping Wang at wang@enqr.ipfw.edu

By Monday June 2th – Seating is limited



**Pizza
Provided**

This month's technical meeting will be two parts, with two invited speakers from ANSYS which is the leading supplier of CAE software for finite element analysis, computational fluid dynamics, electronics and electromagnetics, and design optimization.

Tech Presentation I: A Complete Li-Ion Battery Simulation Model, 6:30PM-7:15PM

Speaker: Dr. Xiao Hu, Principal Engineer, ANSYS Inc.

Abstract: Due to growing interest in hybrid and electric vehicles, li-ion battery modeling is receiving a lot of attention from designers and researchers. This presentation shows a complete model for a li-ion battery pack. It starts from the Newman electrochemistry model to create the battery performance curves. Such information is then used for cell level battery equivalent circuit model (ECM) parameter identification. 28 cell ECMs are connected to create the module ECM. Four module ECMs are connected through a busbar model to create the pack ECM. The busbar model is a reduced order model (ROM) extracted from electromagnetic finite element analysis (FEA) results, taking into account the parasitic effects. Battery thermal performance is simulated first by computational fluid dynamics (CFD). Then, a thermal linear and time-invariant (LTI) ROM is created out of CFD solution. The thermal LTI ROM is then two-way coupled with the battery pack ECM to form a complete battery pack model. Thanks to the ROM technology, such a battery pack model can finish a complete charge discharge cycle within seconds of simulation time.

Tech Presentation II: High Power Electronics Design, 7:20PM-8:05PM

Speaker: Dr. Zed Tang, Technical Specialist, ANSYS Inc.

Abstract: The competitive power electronics market requires engineers to design more compact and complex designs which can lead to challenges in thermal management and EMI/EMC. ANSYS provides a variety tools for the analysis of power electronic systems including semiconductor characterization methods that create accurate electro-thermal device models. Used in a system simulation analysis, these models provide valuable information about the system performance such as junction temperature and voltage spikes. This presentation introduces a design method that can help engineers understand power device switching behaviors so that losses and potential EMI/EMC issues can be predicted.