

Agenda

Electric Vehicle Development

One of the biggest challenges of electric vehicle design is developing robust battery management systems to improve the vehicles range and performance. Electric systems and battery designs are evolving rapidly, with new materials being developed, and advanced battery management systems being implemented to monitor the SOC, SOH of the batteries.

From an NVH and durability perspective, engineers have to monitor the integrity of these subsystems, which requires new and improved methods of simulation and testing. Therefore, it is important to understand the types of analysis and tests conducted along the life cycle of the battery and its control system design.

In this seminar, Siemens PLM Software engineers will provide a deep insight into the various CAE analysis and test methods that are being deployed in the industry today.

This seminar will answer questions like:

- How can users develop battery cell or pack models with varied levels of fidelity?
- How can lumped modeling tools be applied for battery modeling and battery management systems?
- How to develop advanced, dynamic models of cells using HPPC/experimental data (Battery assistant tool with DoE and optimization routines)?
- How to develop various thermal management techniques for battery cooling (liquid, air or 2-phase)?
- How to perform measurements within strong EMF fields?
- What unique NVH challenges are associated with an EV?

Agenda

Understanding Vehicle Thermal and Mechanical Efficiency in an Electric Vehicle

- Powertrain sizing for performance and range at various stages of development cycle
- Vehicle thermal management solutions to predict energy distribution and consumption
- Understanding the driveline and the vehicle NVH during drivability maneuvers (key-on, vehicle launch, tip-in/ tip-out, judder, etc.)
- Bringing it together through a dedicated simulation for attribute balancing in concept stage

Challenges and Solutions for xEV System Development

- Trends and challenges in xEV controller development
- Model-based approach to front-load xEV control design and validation
- Key features of BMS for xEVs
- Case studies

Measurement and Modelling Challenges with EV Vehicles

- Current and high voltage measurements
- Syncing analog measurements with digital vehicle canbus networks
- Analyzing PWM switching frequency issues, including acoustic performance
- Modelling electric motor noise
- Making analog measurements in the presence of strong EMF fields (ex: strain gauges)