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EMC/EMI in Electric Vehicles

Resolving Electromagnetic Issues with Simulation

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The automotive industry is in an essential state of flux, with electronics and electric systems transforming the automotive experience. Vehicle-to-Vehicle (V2V), Vehicle-to-Infrastructure (V2I), Advanced Driver Assistance Systems (ADAS), autonomous driving, electric drive, and wireless charging are the driving forces of today's innovations. With a predicted 50% of the total automobile cost to come from electronics in the vehicle, it is critical to obtain optimized product designs within the tight constraints of costs and time to market.

This presentation gives a quick overview of the requirements coming from new generations of vehicles regarding

- design and optimization of electronics, battery and electric powertrain
- parasitics extraction and thermal management
- EMC/EMI analysis and compliance tests

On the example of a conducted emissions analysis of an electric powertrain, the presentation demonstrates in more depth how electromagnetic simulation helps to achieve these goals, and which modeling preparations, simplifications, segmentations and hybrid simulation approaches are required to make CE simulations on system level possible.