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Advanced Modelling for Automotive Applications in Electric and Multi-Powertrain Vehicle Design

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Session Abstract

Keywords: *Automotive, modelling, machine learning, powertrain, vehicles design, simulation capabilities*

The introduction of new, greener powertrains in automotive applications has led to the need of developing new modelling tools and approaches both to the design of vehicles, which are moving towards a multi-powertrain approach, and individual components (magnetic modelling for electric motors, multilevel modelling for battery systems and cells, etc.). For electrochemical cells, in particular, improving simulation capabilities is key to catching up with current market leaders.

At the same time, approaches like machine learning, big data can deliver order of magnitude improvements in computing times and therefore time to market.

EU-funded projects working in these domains will present their advances and their future programmes.

Session projects and papers:

e-Component Models for Optimal Design of Electric Vehicles (OBELICS Project)
Horst Pfluegl, AVL List GmbH, Graz, Austria, horst.pfluegl@avl.com

Interchangeable Multi-Fidelity Model in the Loop Simulation of Electric Powertrains – A Potential Analysis Using the EleMA Reference Architecture
Anna Isabel Ramones, Orhun Isisag, Jakob Andert, RWTH Aachen University, Aachen, Germany, ramones@vka.rwth-aachen.de
Iosu Aizpuru, Mikel Mazuela, Mondragon Unibetsitatea, Arrasate/Mondragon, Spain, iaizpuru@mondragon.edu
Jens Ewald, FEV Europe GmbH, Aachen, Germany, ewald_j@fev.com

The UPSCALE Project - Application of Artificial Intelligence Enhanced CAE Tools in Vehicle Development
Enric Aramburu, IDIADA Automotive Technology SA, Spain, Enric.Aramburu@idiada.com

Proper Generalized Decomposition (PGD) for Inertia Relief Problems and Parametric Modal Analysis (UPSCALE Project)
Fabiola Cavaliere, Sergio Zlotnik, LaCaN, UPC Barcelona, fabiola.cavaliere1@upc.edu ,
R. Sevilla, Swansea Univ., United Kingdom
Xabier Larrayoz, Centro Tecnico de SEAT, Martorell, Spain, Pedro Diez, UPC, Barcelona, Spain

Nonintrusive Uncertainty Quantification of Crashworthiness Simulations with VPS/ Pamcrash
Marc Rocas, Xabier Larráyoz, [1]SEAT, Martorell, Barcelona, Spain
Alberto García-González, Pedro Díez, LaCàN, Escuela Técnica Superior de Ingeniería de Caminos, Canales y Puertos, Universitat Politècnica de Catalunya, Centre Internacional de Mètodes Numèrics en Enginyeria (CIMNE), Barcelona, Spain, pedro.diez@upc.edu