Final Event
24-25th of May 2022

Validation

BEV virtual model

Powerful Advanced N-Level Digital Architecture
for models of electrified vehicles and their components

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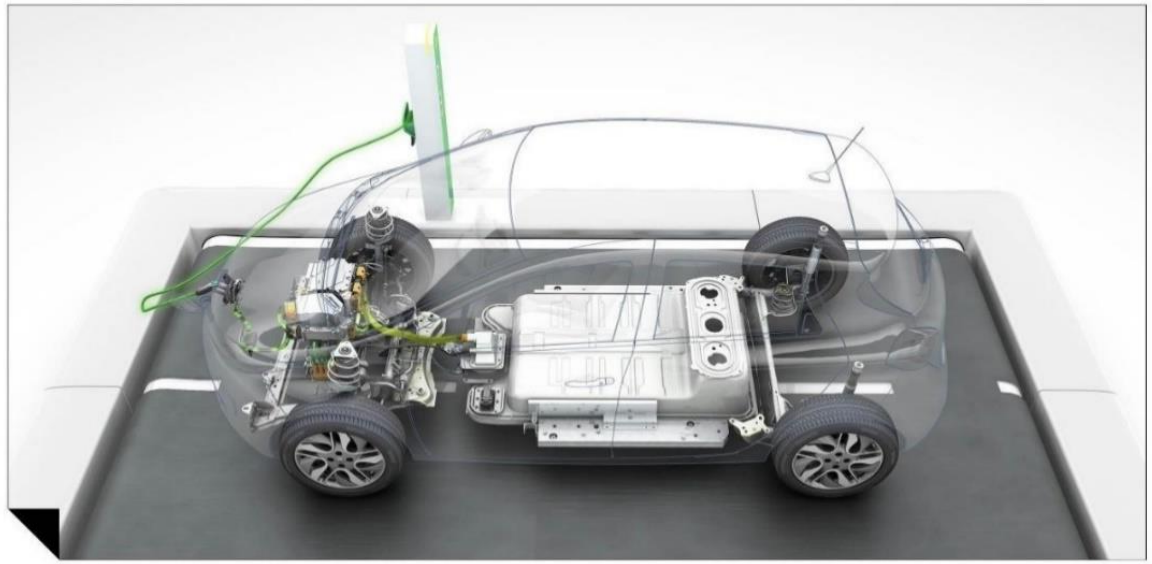
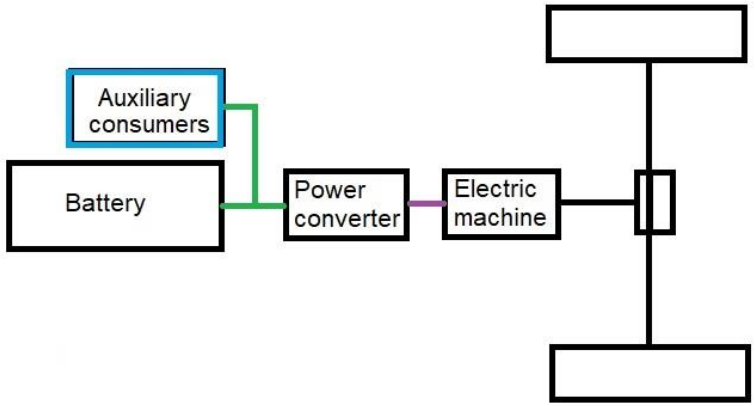
Objective

- **Renault ZOE** car was selected for validation of **Battery Electric Vehicle (BEV) virtual model validation**
- **Measurements** were performed on the car in **RTR technical center in Romania**, on a highway and in Bucharest city
- **Models of powertrain components** and systems and car body were developed **according to EMR constrains**
- **Measurements** were done using **onboard equipmen**t of the car

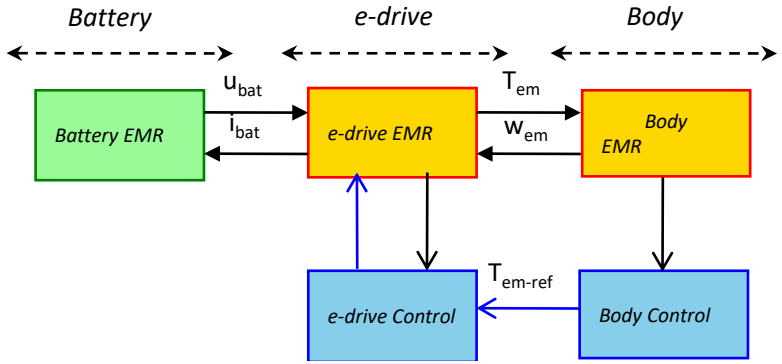


Simulation organization

Powertrain elements of the BEV

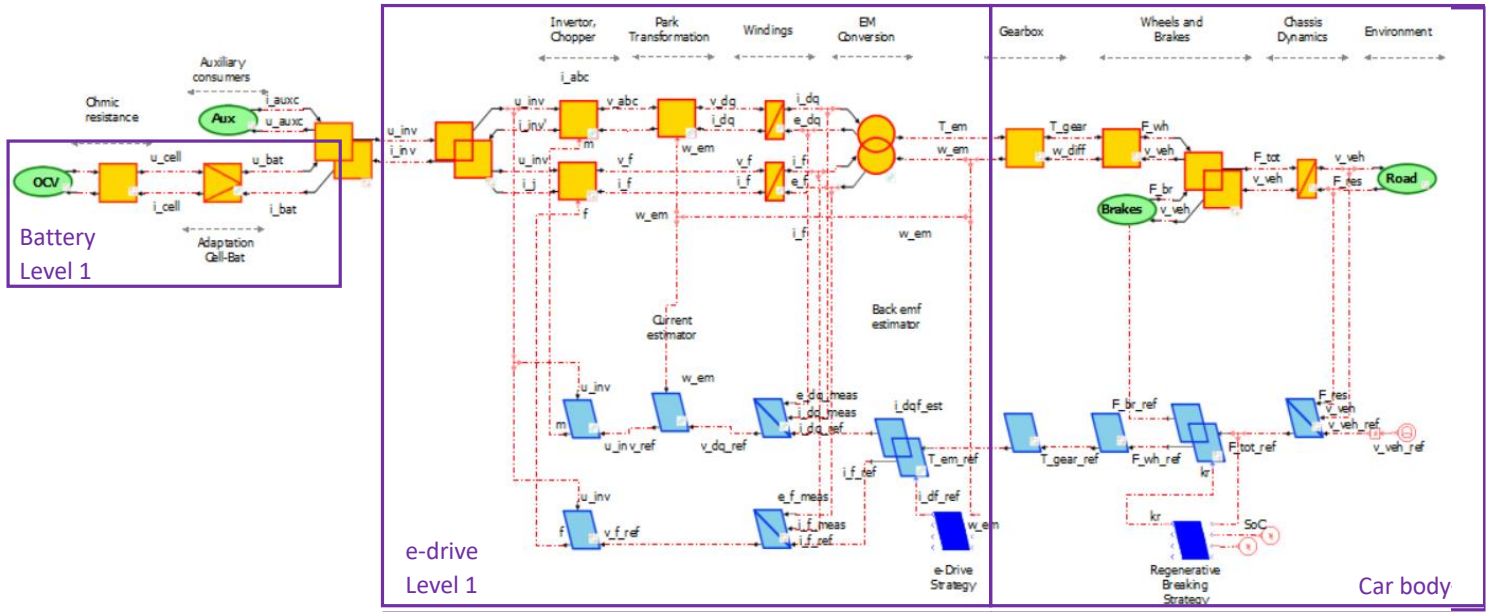


EMR of the BEV



Level-1 model for BEV

Using Simcenter Amesim©



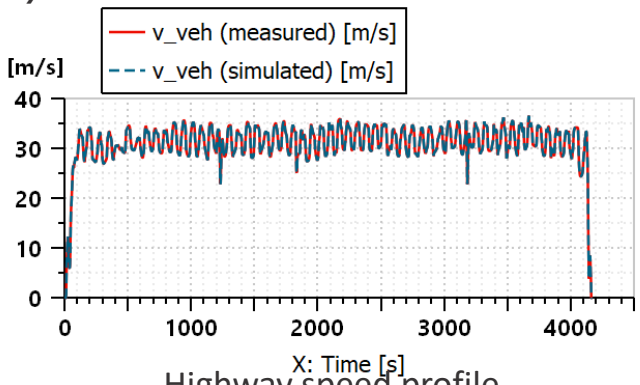
- Battery, e-drive and car body models were connected using EMR methodology
- Models with different level of complexity were developed for each component
- A specific architecture was used where models can be replaced very easy

PANDA - GA 824256

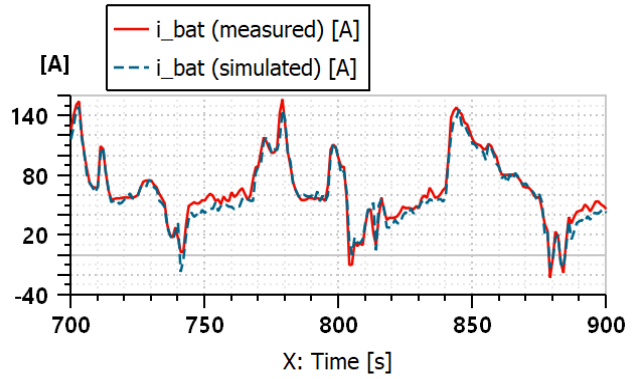
Experimental validation

- To validate BEV virtual model –> **highway test (1.2h)** + **urban test (2.5h)**
- Results form BEV architecture using level 1 models are presented below

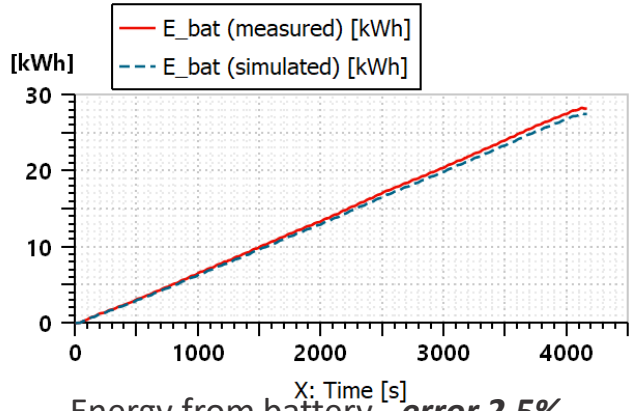
Highway test results:



Highway speed profile

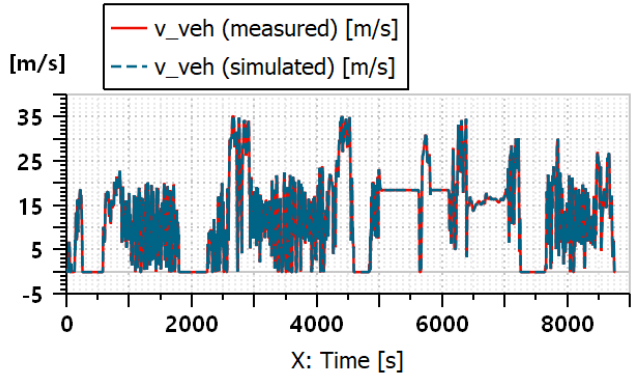


Battery current profile (zoom)

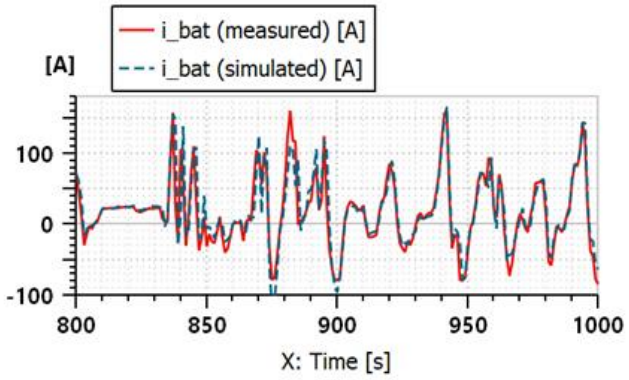


Energy from battery - ***error 2,5%***

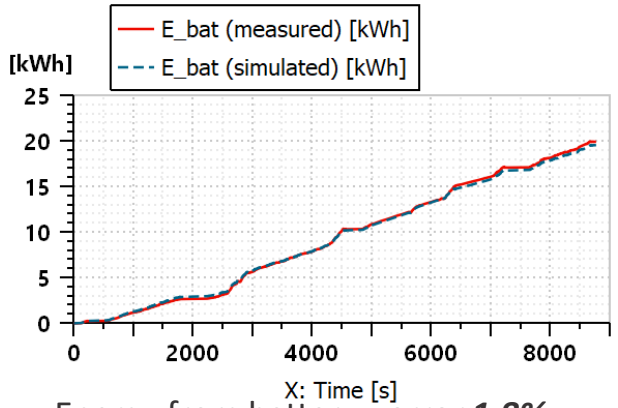
Urban test results:



Urban speed profile



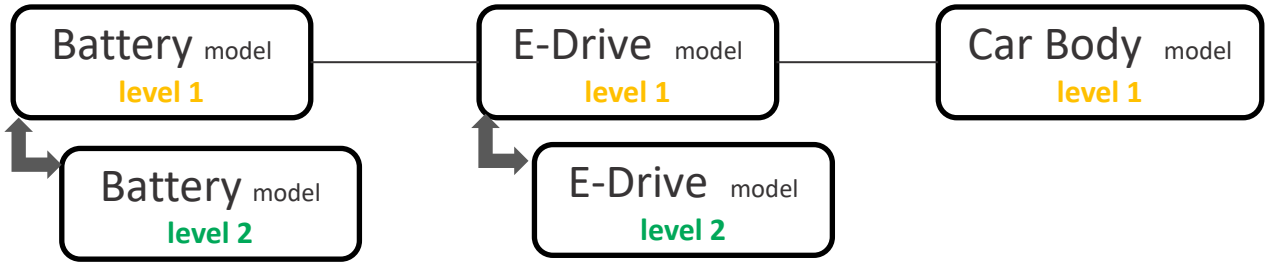
Battery current profile (zoom)



Energy from battery - ***error 1,8%***

Conclusion

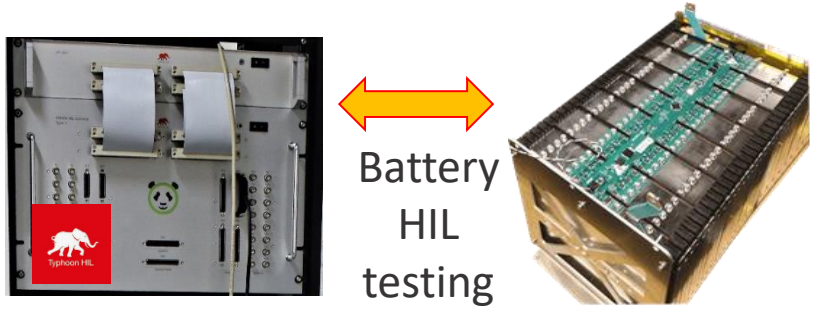
1. **Flexible organization** for simulations proposed by PANDA Project was validated on Renault ZOE car



Models with different levels of complexity can be replaced very easy in global model of the car.

2. **Very good precision** in simulation for all parameters of the models
   - Precise simulation of specific parameters of models (e.g.: e-drive current and voltage **<6% error**)
   - Precise simulation of global parameters of the car (e.g.: energy consumption from the battery **< 3% error**)

3. **Models were used for virtual testing and real testing** (HIL) (see demos)



Thanks for your attention!

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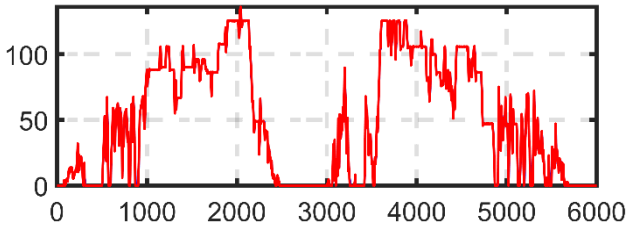

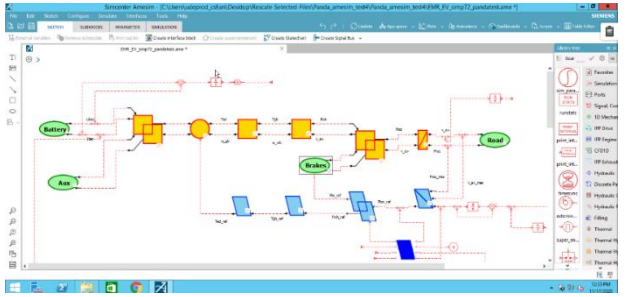

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