

Final Event
24-25th of May 2022

Industrial Feedback

Siemens Industry Software – Feedback



Powerful **A**dvanced **N**-Level **D**igital **A**rchitecture
for models of electrified vehicles and their components

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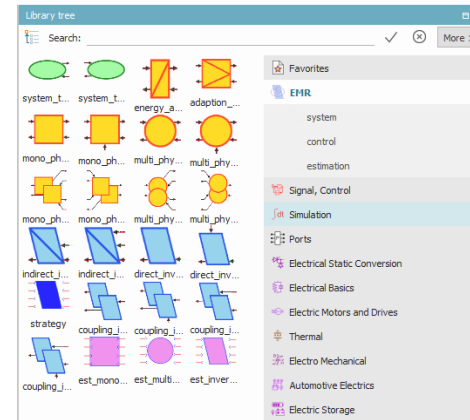
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PANDA impact on Siemens simulation software



- 🐼 EMR library in Simcenter Amesim
- 🐼 in collaboration with ULille



- 🐼 Cloud simulation platform with Rescale



- 🐼 Cloud storage infrastructure with Amazon



PANDA impact on Siemens simulation software



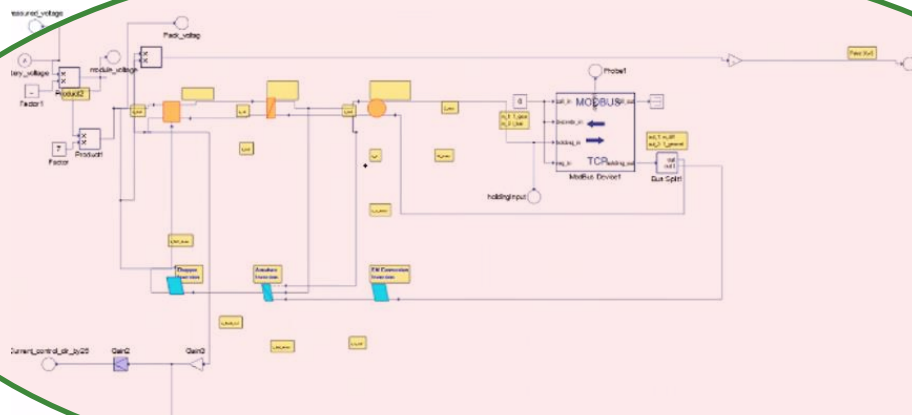
🐼 Collaboration with Typhoon HiL

🐼 Prototyping in Simcenter Amesim a new HiL provider;

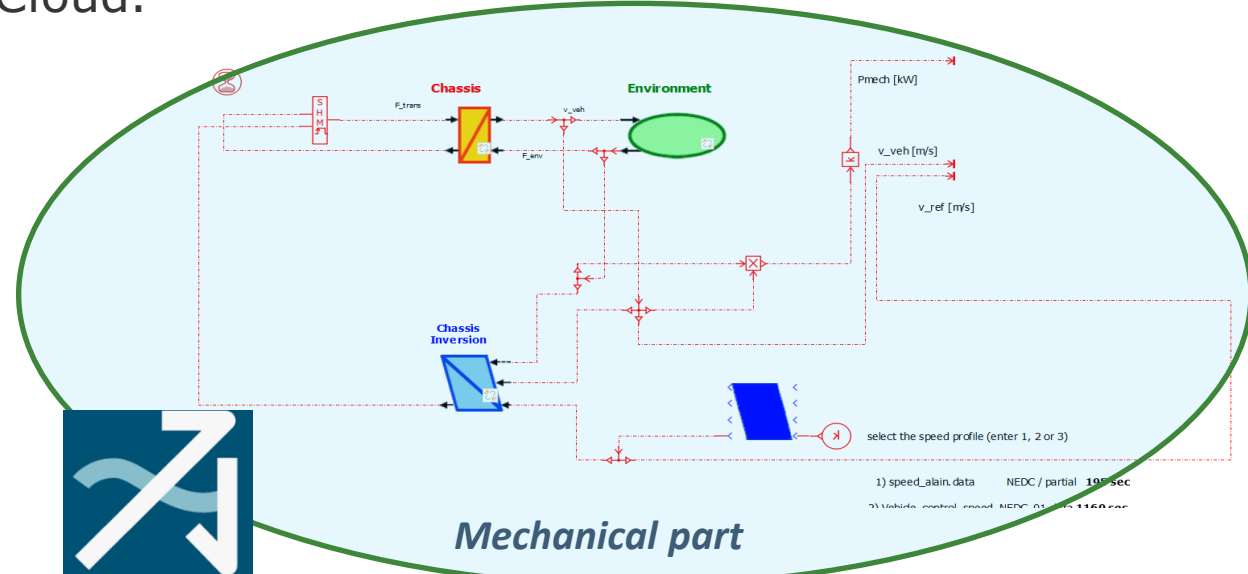
🐼 Converter tool to translate EMR models from Simcenter Amesim to Typhoon HiL;

🐼 Perform co-simulation HiL test from distance;

🐼 Perform co-simulation HiL test trough Cloud.



Electrical part



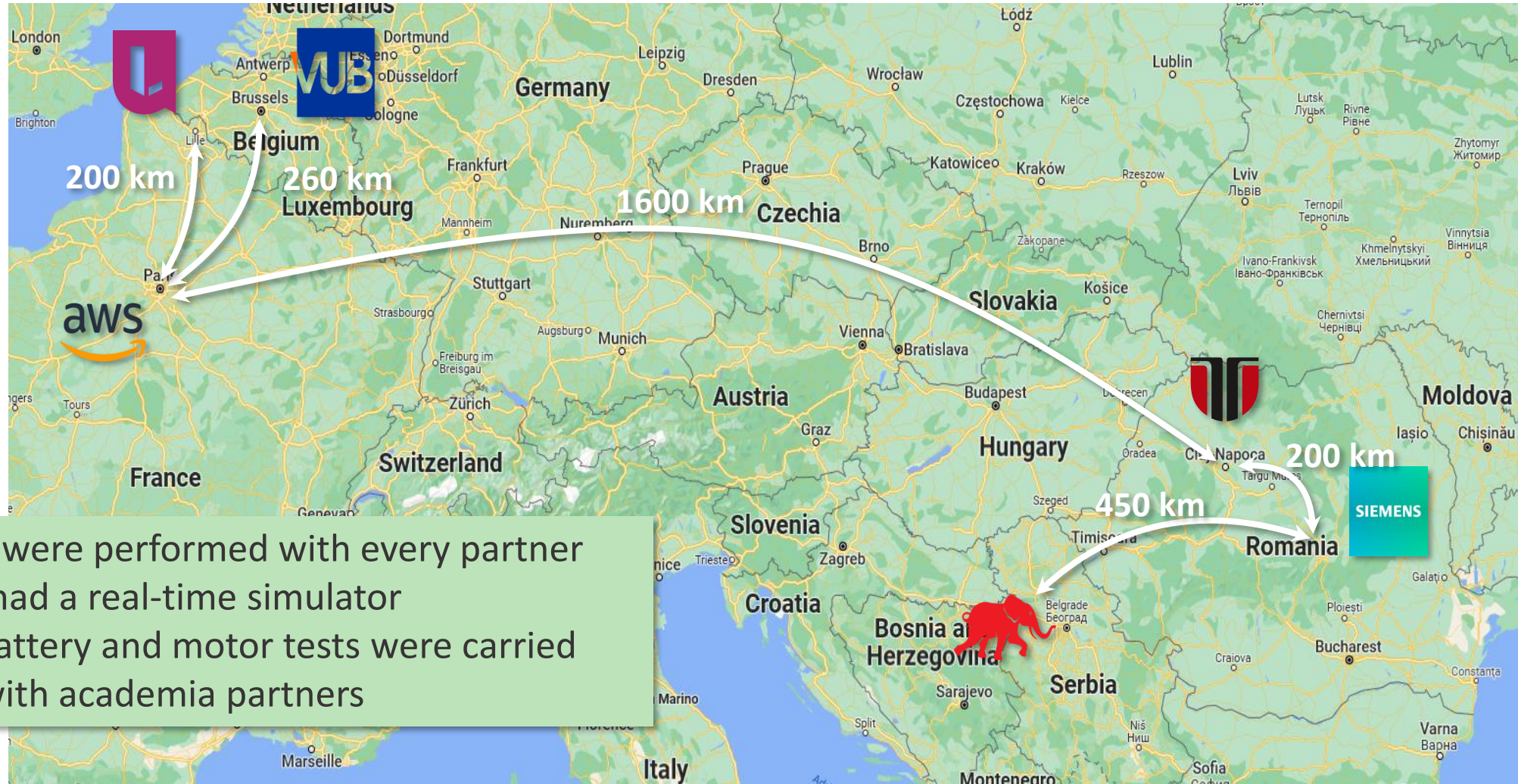
Mechanical part



PANDA impact on Siemens simulation software



🐼 Participants in Cloud HiL cosimulation



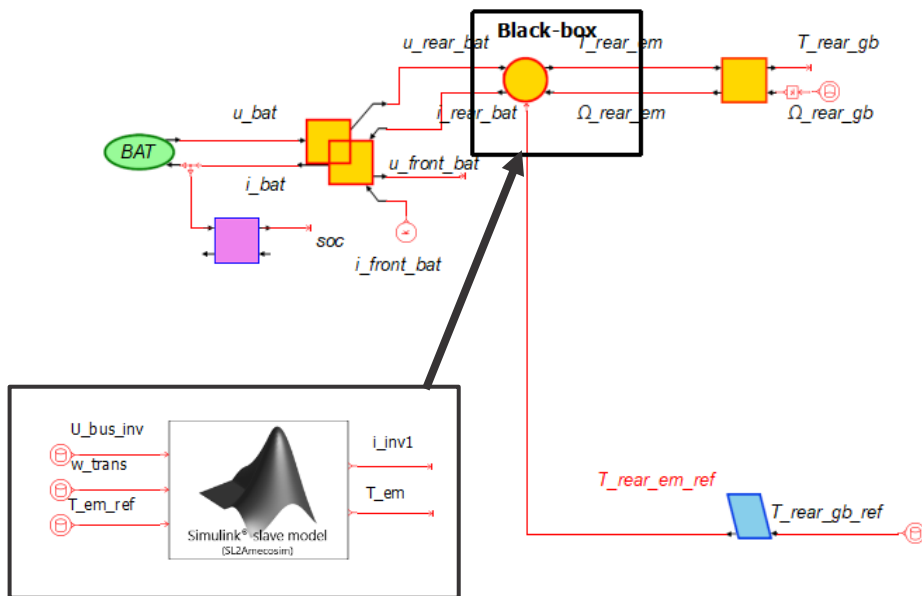
- Tests were performed with every partner that had a real-time simulator
- HiL battery and motor tests were carried out with academia partners

PANDA impact on Siemens simulation software



🐼 Collaboration with Valeo

🐼 EMR e-drive black-box available in Simcenter Amesim library models



H2020 PANDA GA#824256

EMR-black-box model

Part 9: Import Simulink Black-box model into Simcenter Amesim

Objective: In this tutorial we are going to learn how to transfer a MATLAB Simulink model into Simcenter Amesim in the form of a black-box model.

Black-box model
It is sometimes the case that system model developers want to protect their models through intellectual property rights.
However, developers still want to share models without sharing their implementation details such as equations or internal parameters.
The purpose of the models will be to provide the outputs of the model based on inputs.

- In this presentation, we will learn how to transfer a MATLAB Simulink model into Simcenter Amesim in the form of a black-box model.

A black-box model is a model whose inputs, outputs, and functional performance are known but whose internal implementation is unknown or irrelevant.

Inputs → Black-Box Model → Outputs

Simcenter Amesim allows to import models from Simulink as black-box models. When a Simulink model is imported in Simcenter Amesim its equations become hidden.

There are two ways of importing a Simulink model into Simcenter Amesim:
Direct model import (sl2ame),
Co-simulation (sl2amecosim).

This tutorial is related to the EMR library in Simcenter Amesim, library developed within the H2020 PANDA Project by Siemens Industry Software S&L Romania. EMR is a graphical formalism developed by L2EP of University of Lille since 2000.

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Direct model import (sl2ame):

- Use the function sl2ame.
- The Simulink model generates Simcenter Amesim submodel code that uses the Simcenter Amesim solver.

Co-simulation (sl2amecosim):

- Use the function sl2amecosim.
- Generates an Simcenter Amesim submodel that uses the fixed-step Simulink solver.

Co-simulation is the recommended method as it is overall more robust and less sensitive to changes in SimulinkCoder, than direct import.

Requirements

- MATLAB-Simulink
- Simulink Coder (or Real-time workshop)
- For Linux: an ANSI C compiler that is supported by Simulink
- For Windows: Microsoft Visual C++ (standard edition or higher)
- Simulink interface for Simcenter Amesim

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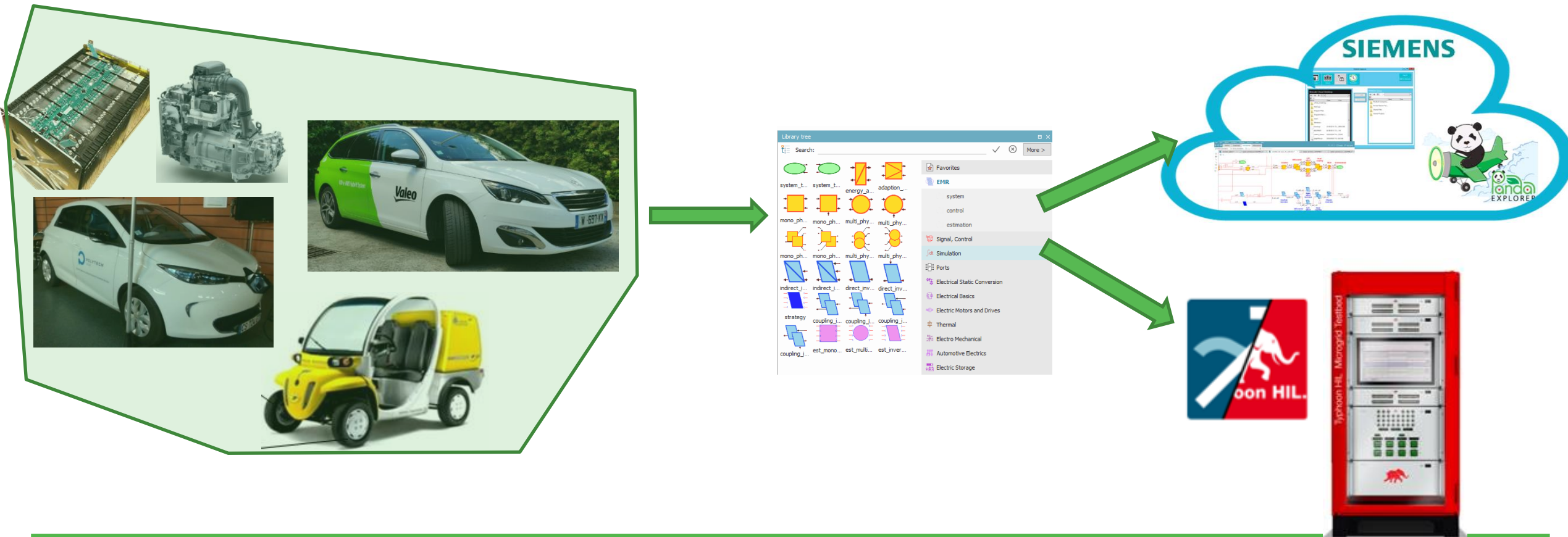
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PANDA impact overview



- 🐼 Collaboration with ULille, UTCN, VUB, RTR, UTBM, Valeo and TY
- 🐼 New EMR n-level validated models available for local and/or cloud simulation and HiL test



Going forward ...



- 🐼 Continue to work on integration and optimization of Cloud testing;
- 🐼 EMR library included in standard Simcenter Amesim version → further investigation for integration into product;
- 🐼 Develop an EMR library for Simcenter Amesim student version → further investigation.





End of presentation

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"Which is more important," asked Big Panda, "the journey or the destination?"

"The company," said Tiny Dragon.



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