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all types of electrified vehicles and components

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Publishable Executive Summary

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The PANDA project aims at using the W-model approach, which relies strongly on virtual design and test methods, to reduce the electrified vehicles time-to-market. The project proposes a standard efficient virtual and real testing method of electrified vehicles and will provide a Cloud library of functional models to be accessible by multiregional companies [PANDA 2020]. In this context, building multi-scale multi-physical models of the electrical subsystem is an essential part of the project.

This deliverable describes the work done in WP5 for the task 5.3 on the real e-subsystem of the studied plug-in hybrid electric vehicle, which is composed of the 48 V battery and two electrical drives, at the front and at the rear axles. Two different real tests have been achieved using the power hardware-in-the-loop method. The real-time simulation of the traction subsystem is realized from the energetic macroscopic representation of the vehicle developed in WP4. The first test has been achieved at full power, i.e. full-scale, at VEEM using the real rear e-drive and the real battery. A second test has been achieved without the battery on the versatile experimental platform of ULille, using two reduced power electrical machines and inverters (reduced-scale test). Moreover, both dSPACE and Typhoon controller boards were used as real-time simulators. The simulation models were derived from MATLAB Simulink © and Simcenter AMESIM © using EMR libraries. All tests were realized in stand-alone controller board, i.e. all real-time models are simulated locally without cloud connection.

Both full-scale and reduced-scale tests lead to similar results, which demonstrate the portability of the method for different electrical subsystem. Moreover, two kinds of simulation packages and real-time simulators have been used for the real test of the e-subsystem. This demonstrates the flexibility of the PANDA method.

Contributions:

No	*Who*	*Description*
1	Walter LHOMME (ULille)	Task leader and writing
2	Florian TOURNEZ (ULille)	Simulation tests Experimental tests at VEEM and ULille
3	Sylvain ROQUET (VEEM)	Experimental tests at VEEM
4	Alain BOUSCAYROL (ULille)	Revisions

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Table 2: Project Partners

#	Type	Partner	Partner Full Name
1	UNIV	ULille	Université de Lille
2	IND	SISW	Siemens Industry Software SRL
3	UNIV	VUB	Vrije Universiteit Brussels
4	IND	VEEM	VALEO Equipement Electriques Moteur SAS
5	UNIV	UTCN	Universitatea Tehnica Cluj Napoca
6	SME	TY	Tajfun HiL (Typhoon HiL)
7			(change of TUV by TUV-BT)
8	UNIV	UBFC	Université Bourgogne Franche-Comté
9	SME	UNR	Uniresearch BV
10	IND	RTR	Renault Technologie Roumanie
11	SME	Bluways	BlueWays International bva
12	IND	TUV-BT	TUV SUD Battery Testing Gmbh

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