



Optimization of scalaBle rEaltime modeLs and functiOnal testing for e-drive ConceptS

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Written By	Nicola Tobia, Daniel Roiu (CRF) Thomas D’hondt, Mathieu Sarrazin (SIE-NV) Gerhard Benedikt Weiss (ViF), David Delichristov (VIF) Ronan Mothier (RT-SAS)	2018-11-23
Reviewed by	Laura Vitale (FCA) Luca Pugi (UNIFI)	2018-11-29 2018-11-29
Approved by	Horst Pfluegl (AVL) – Project Coordinator	2018-11-29
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Publishable Executive Summary

The document provides a detailed description of five industrial prospective use cases from OEMs, Tier 2 companies and research institutes defined as the reference use cases of cluster 2 “E-vehicle system integration, optimization with real world verification (Model based testing)”. Main purpose of this cluster is to support methods and tools development to enable a faster workflow for new electric powertrain design and an efficiency optimization. This cluster targets to reach within objectives of OBELICS are: efficiency improvement by 20% and reduction in development efforts by 40%.

To support these developments, all use cases have the common characteristic to work on integration of the different models of a vehicle, on transfer of these models between environments (MIL, HIL, XIL) and on design optimization (in terms of efficiency) of future EVs in shorter development time at lower costs.

E-vehicle system simulation/optimization & real world verification with testing activities is one of the most time consuming tasks during the e-vehicle or e-powertrain development. The huge efforts do not only reside in creating and planning test-cases but also in setting up these test cases in different testing environments. Especially if certain tests must be repeated more often throughout the process, the needed efforts grow enormously, since every testing environment uses different tools and parameters. If there are additionally different variants of a component or system – e.g. one inverter configuration could be used for different vehicle variants – the effort increases exponentially. A single test automation tool, which could be used for different test environments, would result in great simplifications and effort reductions. It is also very important that the results of different test environments are easily comparable with each other and provide the same results; this will be ensured with back to back testing.

Another issue is the simultaneous use of models together with real components in one test environment. The models must be real-time capable in this case, and therefore often include model-simplifications. The methods to do these simplifications fast and easy whilst preserving the real-time capability shall be provided with these use cases. Models must be easily switchable (transferable) from one environment to the next.