Hiperform. Optimización de conductores de alto rendimiento Wide Band Gap a través de simulaciones multifisicas para la eficiencia energética

Consorcio: Tecnalia, Ibermática-i3B, Idiada Automotive y Modemsys junto con organizaciones de Austria, Alemania (incluido el Instituto Fraunhofer), Bélgica, Italia, Francia, Eslovaquia, Eslovenia y Holanda.

Tecnología: Energía & Utilities; Inteligencia Artificial

Descripción general:

The vision of HiPERFORM is a resource-efficient and decarbonized transportation system supported through the use of advanced and highly integrated wide-bandgap (WBG) technologies in the electronic power circuits of electrified vehicles and the necessary efficient charging infrastructure.

HiPERFORM will investigate advanced production processes and methods for GaN and SiC based switches for the application in automotive domain and aims to enable a long term cost reduction of 40% in comparison with existing samples of these innovative switches.

The project HiPERFORM will research and develop architectures for switching topologies and controllers with SiC and GaN switches that support switching frequencies up to 500 kHz and have 30% less energy losses in comparison to existing architectures, enabling energy efficiencies up to 98% in power train applications.

The partners in HiPERFORM will research and develop compact and reliable concepts for power electronic modules for the use in electrical drivetrains and test systems based on SiC and GaN technologies with up to 50% less spatial volume in comparison to existing modules.

The research work in HiPERFORM will enable EMC compliant next generation inverters, charging devices and test systems built on SiC/GaN technologies that have 30% less energy losses and are up to 50% smaller in size, compared to existing systems. The overall reliability and safety of the system will be at the same level as for drivetrains with Si-technology that is currently investigated in other related research projects for e-drivetrains.

Programa: H2020, ECSEL-2017-2, RIA (783174-1)

Duración: 36 meses (2018-2021)

Presupuesto global proyecto: 41.215.043,70 €

Presupuesto Grupo Ayesa: 844.850,00 €

Este proyecto ha sido aprobado en el Programa H2020, ECSEL-2017-2, RIA y cofinanciado por el Ministerio de Energía, Turismo y Agenda Digital

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GOBIERNO DE ESPAÑA
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Rol de Ayesa:

It participates in the specification of use cases, working together with the consortium to ensure that technical developments are aligned with real application needs across electric powertrain systems, such as inverters, charging systems, and test platforms. In this context, Ibermática contributes to identifying functional requirements and ensuring their traceability to project objectives and performance targets.

Additionally, Ibermática is involved in the definition and management of system requirements and performance indicators, helping establish evaluation criteria and baselines that enable objective assessment of the developed technologies. This ensures that all technical developments can be measured consistently against expected outcomes.

A key contribution of Ibermática lies in the integration and validation of demonstrators. It supports the definition of system architectures, facilitates the integration of components developed by different partners, and contributes to the demonstration of the solutions in relevant environments. This includes analysing system behaviour, identifying potential issues, and supporting iterative improvements.

Furthermore, Ibermática participates in the evaluation phase, contributing to the assessment of whether the project objectives and technical requirements have been successfully met. Its role includes supporting data analysis, performance evaluation, and the preparation of evaluation reports that consolidate results across use cases.

Finally, Ibermática contributes to system-level development and validation activities, supporting simulation, testing, and reliability assessment processes. Through this involvement, it helps ensure that the developed solutions are robust, efficient, and applicable to real-world electric drivetrain and power electronics scenarios.