

Title: Hardware-in-the-loop testing of variable reluctance machines for low-noise automotive applications.

Funding agency: UEFISCDI

Project type: Bilateral collaboration Romania Valonia

Belgian Partner: Universite Libre de Bruxelles

Abstract. The NVH_ _TEST project combines applied research on electromechanical and automotive engineering with the improvement of new technologies for a better preservation of our environment by **answering to the challenges of the electrification of the passenger cars in terms of noise-vibration-harshness (NVH).**

In the frame of the present project different topologies of synchronous machines and their drives are considered and studied in order to evaluate their NVH behaviour. Hardware-in-the-loop tests on available test benches will be compared to models for:

- evaluating the impact of different motor design variables (topology, slot number, stator/rotor pole number combination, dimensions, etc.) and control strategy type on the noise and vibration level of the drive under study;
- optimization of the electrical machine through the implementation of an optimization procedure on the coupled electromagnetic-vibro-acoustic models.

Publications

1. S Ciceo, CT Faria, J Gyselinck, **C Martis**, Multi-Attribute, System-Level Design Process for Automotive Powertrain Electric Drives: An Integrated Approach, SAE International Journal of Alternative Powertrains, Volume: 7, Issue Number: 2 Publisher: SAE International ISSN: 2167-4191 EISSN: 2167-4205 10.4271/08-07-02-0007, 2018.
2. Florin P. Pop, Radu Martis, Cassio Faria, Fabien Chauvicourt Claudia Martis, Electromagnetic and NVH study for low power, Synchronous Reluctance Machine, 2018 AEIT International Annual Conference