



Power converter and motor test stand

Overview

The **Instituto Tecnológico de Aragón** (ITAINNOVA) is a public non-profit research centre. Its mission is to promote the competitiveness of industrial sectors by means of development, adaptation and transfer of innovative technologies. It was established in 1984 and currently hosts over 230 employees. The overall Institute covers different working areas such as research, development and technological services associated to ICT, industrial processes, electrical systems, mechatronics, materials and components. The activity of the institute is focused on several sectors such as automotive industry, railways, aeronautics, industrial and scientific sectors, and it participates in several European Union Framework programs for R&D. During the FP6, FP7 and H2020, ITAINNOVA has participated in 44 funded projects for a total volume of 13 M€ in grants.

Smart and Low Noise Power Electronics Laboratory.

The laboratory is specialized in energy storage devices, power converters and Electromagnetic Compatibility (EMC). This knowledge has been applied to the design and development

of smart solutions oriented to optimize the energy efficiency and electromagnetic noise of electrical/electronic systems, mixing new technologies based on energy storage devices and modular designs, power converters and Electromagnetic Compatibility (EMC). This expertise includes:

- Design and development of power converters (AC-DC, DC-DC, resonant)
- EMC test and analysis
- Circuit simulation
- Electromagnetic simulation of Motors/ Antennas/EM shields
- Rapid prototyping of electrical systems
- Energy storage devices characterization (Ultra-capacitor / Li-Ion Batteries)

Facilities & Equipment

The laboratory has two areas; EMC lab and the Power Electronics lab. The EMC lab is fully equipped to perform any EMC measurement. Two semi-anechoic chambers and Faraday cage will allow to

carry out standardized tests as well as EM characterization of mid scale prototypes. The lab is an accredited laboratory for European Directive and several product standards such as automobile and railways standards.

The power electronics lab is equipped with power sources, loads and a test stand for motors and power converters (up to 45 kW) based on Li-Batteries as well as motor / generator test bench for motor characterization (up to 5 kW). The lab includes the dSpace Platform for rapid prototyping of power converters and motor drives.

Simulation and model developing are performed using software environments such as, Psim, Cadence, ANSYS EM & HFSS, Comsol Multiphysics and Matlab/Simulink.

Collaborations

The laboratory has collaborated with industrial partners in R&D projects such as ZF (Germany), SAFRAN (France) or CAF (Spain) as well as big research institutes such as European Organization for Nuclear Research (CERN) from Switzerland or Max Planck Institute from Germany.



EMC characterization of SVD detector for Belle II experiment