ANUNCIO DE SEMINARIO

FEM modeling in electrical engineering using ANSYS software

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Analysis and multi-criteria optimization of complex electromagnetic and electromechanical systems are necessary steps in design and development of efficient and reliable devices for all branches of modern and technologically advanced industrial processes.

Nowadays the most efficient method for such an analysis and optimization is numerical modelling made by numerous mathematical methods and computational tools (software). The modelling can be performed as a single physics (electrical, magnetics, mechanics, thermal analysis) or as a coupled multi-physic analysis (electromagnetic, electromechanical, thermo-electric, etc.). Efficient modelling is a way to reduce costs and time consumption required for the design and development of final products and systems for the industry.

The seminar will be devoted to presentation of various examples of FEM numerical modelling based on ANYSYS software and focused on electrical, magnetic or coupled analyses related to electromagnetics. The results of modelling made by the team of researchers at the Department of Power Electronics, Electrical Drives and Robotics, Silesian University of Technology (SUT), Poland, will be presented. The most important parts of analysis are power electronic components: coils, transformers, chokes, superconductivity systems and devices, electrical drives, processes of resistance welding and induction heating. Different approaches for modelling (2D, 3D, steady-state, thermal, circuit based) will be presented and discussed.

The final part will include initial presentation of analysis and modeling of the power transformer developed under BIOTRAFO EU project, which is made as an international cooperation, including cooperation between UNL-CIMEC and SUT.