Electric Vehicle HV System Laboratory Setup and Modeling

The problem of environment pollution is still considered to be the most important challenge of the recent years, caused by carbonate and other harmful chemical composites. Thus the main target of all leading car industry companies has become production and development of electro-mobiles by using modern leading technologies. Among the different technical and electric problems, one of the complex tasks is still remained to be the decrease of electro-magnetic radiation while operating of powerful part (inverter, electric engine etc.)

The electric vehicle HV system laboratory setup assembled at EMCoS enables to measure the radiated fields, currents and voltages induced in cables for different working stages. These data are important to develope the rapid and accurate methods of modeling, for their further use in production and in solving the electro-magnetic compatibility problems.

Fig 1. The electric vehicle HV system laboratory setup

The setup is composed of: brushless permanent magnet electro-motor and inverter produced by UQM Technologies (UQM Powerphase 100), control equipment GEVCU, Line Impedance Stabilization Network “LISN” (for current and voltage measurement in supply cables) and powerful 350V/125A power supply. At the first stage the frequency spectrum at LISN output has been measured and was compared to modeling. The modeling results matches well with the data obtained by the experiment.