DESCRIPTION FOR THE GENERAL PUBLIC

The scientific and cognitive aim of the proposed project is the detailed and multivariate analysis of high voltage electrical discharges generated in various types of electro insulating liquids such as mineral oil, synthetic ester and natural ester in terms of the ability to estimate the energy balance for particular electromagnetic radiation fields emitted by modeled electrical discharge forms. It will also be investigated the impact of construction solutions of proposed modeling spark gap a various forms of electrical discharges, in particular the partial discharges and complete discharges, on mechanisms related to their generation.

As part of research and development work it is planned to select and determine the characteristic values of the parameters describing the analyzed phenomena, which will enable to identify unequivocally the basic forms of electrical discharges generated in various types of electro-insulating liquids based on the recorded spectral characteristics of emitted electromagnetic radiation.

Several systems will be selected to generate different forms of electrical discharges, however, the recording and measurement of high-voltage electrical discharges and accompanying physical phenomena will be performed using the acoustic emission method and optical spectrophotometry.

To implement the proposed project objectives, associated with multi-variant physical phenomena accompanying the generations of electrical discharges in electro-insulating liquids are planned to carry out scientific research in two stages: in the first stage, experimental research is planned to be carried out in the High Voltage Techniques Laboratory and in the second stage involves the analysis and interpretation of the obtained results using computer methods in the MATLAB computing environment. Registered parameters and their dependencies will be analyzed using statistical methods.

As a result of the proposed research and science will be the verification of the theory of mechanisms of generation of electrical discharges carried out on various types of electro-insulating liquids and determination of the energy balance of particular forms of energetic changes occurring there.

The results of previous research, supported by his own observation motivated the authors to undertake the proposed research topics.