

The study is dedicated to the problem of the cables electrical insulation for voltage 6-10 kV. The partial discharge characteristics control facility on ac line frequency of 50 Hz was established during the research. The discharge characteristics control and analysis method involving the connection diagrams “The signal resistance insertion in the test object ground ring” (GOST Certification System 20074-83), “The measuring element insertion in the instrument capacitor ground ring” and further configurations of these diagrams was applied for quality evaluation of the cables electrical insulation. Hardware and software including the connection unit for data acquisition, the processing and analysis programs of partial discharge characteristics were developed and tested by means of an electrode system “needle-plane” which operates as a nanopulser in the

Trichel pulse mode. Such parameters of the Trichel pulse as the leading edge and the fall time constant were determined. The pulse leading edge time is 9 nsec. and the fall time constant is 150 nsec.

This automated system for the cables insulation control has extended precision of the partial discharges power-frequency flashover (the partial discharge phase error is one degree), consists of the high- and low-voltage hardware component and software based on the line recorder LGraf2 and program module Delphi 7. The cable insulation fault location technology through the partial discharges characteristics is developed by means of computer modeling and the finite elements method. The technology is based on the electrode system configuration change by means of the ping-pong transmission of high voltage electrodes, ground circuits, signal circuits in a three-core cable. For the technology inspection the experiments on partial discharges characteristics measurement in different ways of the signal circuits' connection were held.

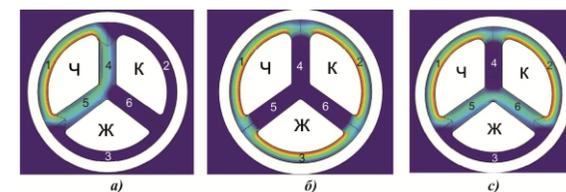


Fig. 1. Cable model ААШВУ 10 kV: а – black wire – potential 10 kV; grading screen, red and yellow wires are connected to ground; б – black, red and yellow wires - potential 10 kV, grading screen is connected to ground; с – black and red wires - potential 10 kV, yellow wire and grading screen are connected to ground.

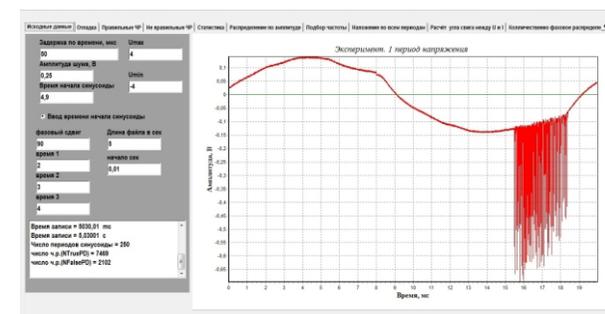


Fig. 2. Main window of the data processing program.



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