Application of Kerr electro/optic effect to electric field measurements in transformer oils

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References:


Abstract:

Paper presents an original method suitable for measurement of electric field distribution in liquid dielectrics (nanosecond time domain). Electric field is reconstructed in two steps: 1) multiangular laser scanning of the space between electrodes provides projection for each laser beam, 2) using a numerical algorithm called Modified Arithmetic Reconstruction Technique (MART) electric field is reconstructed in the plane of laser scanning. Finite Difference Method (FDM) is used to compare and verify experimental results for a symmetrical and asymmetrical electrode configurations. Comparison of experimental (Computerized Laser Tomography) and numerical approach (FDM), confirmed that experimental approach is accurate enough to be used in initial design of many oil-immersed dielectric system.

Keywords:

liquid dielectrics, Computerized laser tomography (CLT, Kerr electro-optic effect, CT), transformer oil