IMPLEMENTATION OF A MODEL-BASED DIAGNOSIS SYSTEM FOR POWER TRANSFORMERS

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ABSTRACT
A Matlab/Simulink implementation of a model-based diagnoses system for power transformers based on structured residuals is presented in this work. Process models for thermal behavior and moisture diffusion in paper are observers for transformer temperatures and relative water concentration in oil respectively. An experimental setup consisting of a medium voltage distribution transformer equipped with a controllable loading setup provides the functionality for heat runs. Both, process models and diagnosis structure are verified by comparing measured and simulated system variables. The diagnosis system is proposed to be implemented either as strictly online fault detection system for large power transformers or as an inexpensive offline evaluation method for medium voltage distribution transformers.