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A Review of Transformer Modeling for Power Line Communication Applications

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Abstract : Power Line Communications (PLC) is being employed in existing power systems, despite the infrastructure not being designed with PLC considerations in mind. Given that power transformers can last for decades, the distribution transformer in particular exists as a relic of un-optimized technology. To determine issues that may need to be addressed in subsequent designs of such transformers, it is essential to have a highly accurate transformer model for simulations and subsequent optimization for the PLC environment, with a view to increase data speed, throughput, and efficiency, while improving overall system stability and reliability. This paper reviews various methods currently available for creating transformer models and provides insights into the requirements of each for obtaining high accuracy. The review indicates that a combination of traditional analytical methods using a hybrid approach gives good accuracy at reasonable costs.

Keywords : distribution transformer, modelling, optimization, power line communications
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