
Master project, 2018 – 2019

— Goal-oriented error estimation in coupled magneto-thermal computations —
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Context

It is important to monitor and evaluate the health condition of electrical power equipment to ensure their safety and reliability. Heating problem is one of the most important factors, which can influence the operation status, physical condition and insulation life of power equipment, for example, Oil-immersed transformers. However, the hot spot is usually located inside the equipment, which implies that the temperature is difficult to measure directly. The main methods on the assessment of hot-spot temperature in power equipment developed nowadays are based on the detections by temperature measurement systems, temperature computed by numerical methods, and temperature forecast based on intelligent learning algorithms. Therefore, a guaranteed result of the temperature by the numerical method (like FEM) becomes critical.

Objective

The objective of the study dedicated to understanding the coupled magneto-thermal computation, and to developing a posteriori error estimation of FEM applied to the quantity of interest as the temperature inside the transformer.

Work steps

- 1 Bibliography on the subject
- 2 Understand the simulation scheme for magneto-thermal couplings
- 3 Develop a goal-oriented error estimator for the quantity of interest as the temperature in thermal simulations.
- 4 Implement in code

Keyword

Assessment of power system, Goal-oriented error estimate, magneto-thermal coupled problem

References

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