Investigation of novel concepts for the mitigation of power transformer inrush currents [SA1-MA1]

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Power transformers are one of the most important components of the energy grid. Although transformers are in use for more than a century, the very high inrush currents (up to $10 \cdot I_N$) occurring during the energization of the transformer are still a problem. Damages of the transformer and false tripping of protective devices can be the result. Several methods have been developed to reduce the inrush current, ranging from series connected resistors, optimal closing instants of the switches to power electronics systems.

In this thesis, novel inrush current mitigation concepts should be investigated. Since inrush currents are caused by core saturation, a detailed transformer model including saturation has to be developed first. Based on a literature research, conventional solutions should be tested with the model. In comparison to these methods, novel concepts deploying power electronics will be investigated.

Tasks:  
20% Literature research  
30% Theory  
50% Simulation

Prerequisites:  
- Interest in power engineering and simulations

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