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UNIVERSITÄT
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FAKULTÄT FÜR ELEKTROTECHNIK
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LENA

Master's thesis

for Ms./Mr.

Topic: Development of an Analog Peak Detector for the Detection of ns-Pulses

Task:

Partial discharge measurement is a common method for monitoring the condition of high-voltage electrical equipment. Partial discharges generate transient voltage pulses in the nanosecond range and with low amplitude. Measuring these pulses is thus challenging and requires a high bandwidth of the measurement device. Digital evaluation of the measured voltage is therefore not practical due to the high sampling frequency of the ADC required. Instead, analog peak detectors are a common approach for detecting partial discharge signals, but their design depends on several factors, including pulse amplitude, duration and shape.

The objective of this work is to develop and evaluate an analog peak detection circuit optimized for the detection of nanosecond PD pulses. The circuit should be able to accurately detect and measure the amplitude of these voltage pulses in the presence of noise and interference.

The study has to cover the following points:

- Literature research on peak detection methods
- Design and simulation of an analog peak detector circuit with e.g. LTSpice
- Experimental test of the circuit
- Evaluation of the performance - Which pulses are measurable/not measurable with the developed circuit?
- Documentation of the results

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