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## 4P56 - Study on Fault Conditions of a Single Stage of Fast Linear Transformer Drivers

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Fast linear transformer drivers (FLTDs) are a rapidly developing field of pulsed-power technology in recent years, which is used to output high-power, high-current pulses. However, an FLTD on terawatt level usually contains more than thousands of switches. As a result, the fault of self-discharge of switches is common in FLTDs. This brings a. important problem that when self-discharge occurs, whether it is necessary or not for researchers to stop the whole process and demagnetize the core again. In this paper, we will analysis how it will affect the output of a single stage of FLTD and give the answer to the question above.

To begin with, a circuit model of a single stage of FLTD with a nonlinear magnetic core, which contains 23 discharge branch based on real FLTD is developed in this paper. On top of that, in order to simulate the fault condition under different working coefficients, one or more switches is set to discharge itself abnormally before the coming of trigger signal. According to this simulation, the output of the current flowing the load and magnetic cores is given when the number of the fault switch increases from 1 to 5, which can provide the prediction of the needs of demagnetization.

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