Contribution ID: **238** Type: **Poster Presentation**

The high voltage pulsed current supply based on Solid-state devices

Thursday 7 July 2016 14:45 (15 minutes)

The output current of a Marx generator will be affected by the value of different loads even though the output voltage has been fixed. A special kind of current pulse generator is needed in experiments and industrial applications, which can generate a current pulse of constant amplitude regardless of the impact that the resistive load fluctuates in a certain range. A novel current pulse generator based on inductive intermediate storage has been constructed. The generator is equipped with a solid-state Marx adder for charging the inductive intermediate storage, an inductor to obtain an expected current which can be controlled by the charging voltage and charging time. The structure of the basic unit in the solid-state Marx adder is redesigned in order to ensure the continuous path of the inductive current and release the current to the loads. There is a total of four steps in a complete discharge process that are determined by the movement of two kinds of solid-state switches, Insulated Gate Bipolar Transistors (IGBT) and thyristors. In this paper the design principles are described in detail and the control method is also given. The designed current pulse generator is able to produce short current pulses of amplitude within 10 A and pulse length from 1 μs to 10 μs when driving variable resistive loads of kΩ scale. The current pulses have a good flat (amplitude fluctuation <5%), a fast-rising edge (<600 ns) and a fast-falling edge (<500 ns). The experiments have verified the characteristics of the new generator, stable, reliable and simple.

Authors: Mr SHI, Haozheng (Fudan University); QIU, jian (Fudan University)

Co-author: Prof. LIU, Kefu (Fudan University)

Presenters: Mr SHI, Haozheng (Fudan University); Prof. LIU, Kefu (Fudan University); QIU, jian (Fudan University)

Session Classification: Poster 2-C

Track Classification: Solid State Power Modulators, Components, Switches, and Systems