Contribution ID: **11** Type: **Oral Presentation**

A new type of composite pulse generator based on variable load

Monday 4 June 2018 11:15 (15 minutes)

To meet the needs of high voltage pulsed electric field for tumor therapy and tissue ablation, a design scheme of high voltage composite pulsed wave source combining classic Marx generator and all solid state switching device is proposed in this paper.Using all solid state switching devices instead of traditional spark gap switches, the unipolar Marx generator is the core of circuit. The output of composite pulse square wave can be realized by the relay switching. In this paper, the structure, working process, control strategy and load adaptability of the circuit are analyzed in detail. using solid state MOSFET as the main switch device, the main circuit part of the pulse source is developed. The corresponding control circuit and switch synchronous trigger circuit are designed, and the signal transmission and the isolation of strong and weak electricity are realized through optical fiber and isolated power supply module.Compared with the conventional high-voltage pulse source, the scheme has a more compact circuit structure and good load adaptability. It achieves the advantages of higher output pulse front, higher pulse frequency, pulse width, and adjustable voltage amplitude.The experimental results show that the system can generate high voltage pulse source amplitude range of 0 ˜ 7 K V, 0 ˜ 1kHz frequency, pulse width range 200ns ˜ 1μs square wave pulse, low voltage can generate the amplitude range of 0 ˜ 1 K V, 0 ˜ 10kHz frequency, pulse width range of 1 μs ˜ 100 μs square wave pulse. In order to find the best electrical parameters, it provides the hardware support for the tissue ablation of composite pulsed electric field and the treatment of tumor.

Authors: KE, Qiang (Chongqing University); Prof. LI, ChengXiang (College of electrical engineering, Chongqing University,China); Mr YAO, Cheng (College of electrical engineering, Chongqing University,China); Mr DU, Jian (College of electrical engineering, Chongqing University,China); Prof. YAO, Chenguo (College of electrical engineering, Chongqing University,Chnia); Prof. MI, Yan (College of electrical engineering, Chongqing University)

Presenter: KE, Qiang (Chongqing University)

Session Classification: Oral 2 - Biomedical & Environmental Applications

Track Classification: Biological, Medical, and Environmental Applications of Power Modulators