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Research of distributed charge based on magnetic self-balance

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This paper describes the principle and design of a high-voltage high repetition frequency solid-state pulse power modulator(SSPPM), which can operate at an output voltage of tens of kilovolts and a repetitive frequency of tens of kilohertz. Charging circuit of traditional Marx generator is generally based on DC power with series resistor or inductance to charge the capacitors, and it leads to low efficiency, small output pulse duty cycle and other issues. However, this new SSPPM operates in series resonant mode and uses series of magnetic ring, which effectively solve the above issues. Due to voltage difference between load capacitors, the compensating third wind is used to make the voltage balanced. Through principle, software simulation and physical comparison, the compensating third wind is introduced in detail.

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