

The application of pulse power technology in the industrial and military fields requires pulse power as a large current generator. The high energy storage density makes the inductive energy storage have a broader application prospect than the capacitive energy storage. In this paper, we choose the meat grinder topology as an example to examine the circuit ...

Inductive energy storage for pulsed power supplies is considered to have great potential because its energy density is 1 order of magnitude higher than that of capacitive one. Associating with the superconducting technology and the STRETCH meat grinder circuit, which proposed by the Institute of Advanced Technology, a superconducting inductive pulsed power supply (SPPS) ...

Currently, pulsed adders are used as pulsed voltage sources maturely. However, their use as pulsed current sources is significantly limited due to circuit impedance and the characteristics of power devices. This paper presents a simple yet effective design for a pulsed current source, incorporating a solid-state Marx pulsed adder as the primary power ...

Inductive pulsed power supply (IPPS) is a promising type of power supplies for electromagnetic launch, but its advantage in energy density is strongly restricted by the primary power source. ... The low energy storage of capacitors limits the number of times and the power system can supply power to the EML; To make matters worse, if IPPS is ...

The cooling cost of high temperature superconductors is much lower than that of low temperature superconductors. By now, a few HTSPPTs have already been tested based on inductive energy storage system [6], [7], [8] and capacitive energy storage system [9]. High energy transfer efficiency can be obtained by using a HTSPPT in a capacitor-based pulsed power ...

An inductor storage power system was used for generating the pulsed plasma. o A micro VACT with inductive energy storage circuit was designed and tested. o A battery was used to reduce the energy consumption of the entire VAT unit. o VAT prototype proposed in this study achieved a single impulse of 2.3 mNs. o

The principle of the superconducting inductive energy storage and of superconducting pulse switching is reviewed. Design criteria are discussed by introducing two different laboratory set-ups. Special emphasis will be laid on the methods of charging the energy storage and on the pulse switching. The layout and dimensioning of an experimental pulsed power supply with an ...

Due to the low electrical losses and low charging power requirements, the application of superconducting inductors in the inductive pulsed power supply (IPPS) for Electromagnetic Launch (EML) has great potential.

# Inductive energy storage power supply

In our previous studies, a repetitive IPPS circuit was proposed based on a high temperature superconducting pulsed power transformer ...

By now, a few HTSPPTs have already been tested based on inductive energy storage system [6], [7], [8] and capacitive energy storage system [9]. High energy transfer efficiency can be obtained by using a HTSPPT in a capacitor-based pulsed power supply [9], but the energy density of the whole system is still inadequate. As superconducting ...

Superconducting pulsed-power supply (SPPS) provides an efficient method for both high-density inductive energy storage and high current pulse generation. An SPPS consisting of eight high-temperature superconducting pulsed-power transformer (HTSPPT) modules with XRAM methodology was designed and simulated in preliminary studies. It recycled the ...

Inductive energy storage addresses this challenge by capturing surplus energy generated during peak production and dispatching it when necessary, ensuring a continuous and stable energy supply. Furthermore, inductive storage technologies contribute to grid stabilization, particularly as more decentralized renewable resources come online.

The superconducting inductive pulsed-power supply (IPPS) is considered to have broad application prospects in the field of electromagnetic launch because of its low electrical loss. ... Inductive energy storage for pulsed power supplies is considered to have great potential because its energy density is 1 order of magnitude higher than that of ...

By adopting a simple inductive energy storage (IES) circuit [7] and the "triggerless" ignition method [8], the mass of the propulsion system can be decreased to less than 200 g, with a specific impulse of  $>1000$  s and a power level ...

inductive energy storage circuit ... instead of a power supply system to reduce the energy consumption of the entire VAT processing unit. The energy required for a single pulse was estimated to be 0.266 J, by measuring the change between the discharge current and the voltage. The ion current was measured using an ion detector and was 3.55 A ...

Generally, capacitive energy storage pulsed-power generators, for example a Blumlein generator, and magnetic compression and capacitive-transfer type of circuits, are used as a power supply of a pulse laser excited by discharge. Their operations are possible by using only a closing switch. Many practical and commercial switches have been already developed. ...

The pulsed power supply (PPS) is one important component in the electromagnetic launch system. The inductive PPSs have attracted researchers' attentions with the major advantages of high energy storage density (over the capacitive PPSs) as well as simple structure and easy control (over the rotating mechanical PPSs). As for the inductive PPSs, the ...



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