Inductive energy storage pulse power supply

Can a battery be used as an inductive pulsed power supply?
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. Fortunately,batteries become a suitable and practical choicefor the primary source.

What is inductive pulse power supply (IPPs)?
Due to its advantage of energy density, inductive pulse power supply (IPPS) has become a promising type of power sup-plies for the electromagnetic launcher (EML) [1, 2].

What is capacitance transducing inductive energy storage pulsed power system?
The new capacitance transducing inductive energy storage pulsed power system is as shown in Fig. 1.8. This circuit also uses the transducing capacitor to solve the overvoltage problem of the circuit breaker, without requiring mutual inductance between the coils, and it is easy to achieve series charging and parallel discharging.

What is a high-power pulsed power supply?
It constitutes the main body of the pulsed power device, as in almost all parts of the pulsed power device are included. The main feature of high-power pulsed power supply is the slow accumulation of energy at a rather low power before the instantaneous release of high power and large energy.

What are the components of a pulsed power supply?
The pulsed power supply consists of an adjustable DC voltage power supply, E1, a filtering current-limiting inductance, L1, a resonant energy storage capacitor, C1, a feedback diode, DT, of the fast switching thyristor, D1, and a resonant circuit L2 which composes of resonant inductors.

What is a pulsed power supply (PPS)?
Abstract: 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).

Rather than use a power supply rated at the peak pulse power, PPEAK, to drive the load directly, as shown in Fig. 8(A), it is generally more practical -- perhaps even mandatory -- to use a much smaller power supply rated at the average pulse train power, PAVG, and an energy storage system capable of storing the energy of at

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The energy storage capacitor C, the pulse forming inductor L, the discharge thyristor T ... capacitive hybrid meat grinder circuits for an inductive pulsed power supply," IEEE Trans. Plasma Sci ...

An inductive energy storage pulse power system is being developed in BARC, India. Simple, compact, and robust opening switches, capable of generating hundreds of kV, are key elements in the development of inductive energy storage pulsed power sources. It employs an inductive energy storage and opening switch power conditioning techniques with ...

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

Higher energy density makes inductive energy storage more promising than capacitive storage for pulsed power supplies in industrial and military fields. To realize high ...

proposes a multiphase interleaved pulse power supply with energy recovery and inductive storage (MIEF-PPS). The basic concept of the topology is the inclusion of a multiphase converter with pulse forming circuits to the converter system, which decouples the current slew rate and current ripple. Using an inductive storage

Stretch meat grinder [] is one of the most typical topologies of the inductive energy storage pulse power supply belongs to the Institute for Advanced Technology (IAT) [] gure 1 shows the topology of the STRETCH meat grinder. In the STRETCH meat grinder circuit topology, two highly coupled inductance coils L 1 and L 2 are composed of multiple ...

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 ...

A compact pulsed high-voltage generator has been developed for applications in pulsed gas discharges. Its operation principle is based on inductive energy storage and it uses a static induction thyristor as the opening switch. It is capable of generating pulsed high voltage of ~15 kV with pulse width of ~200 ns for load resistance of 1 kOmega. This generator can be ...

Superconducting inductive pulsed power supplies have attracted a lot of attention due to its lower electrical loss and higher energy storage density than traditional inductors.

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1 INTRODUCTION. Due to its advantage of energy density, inductive pulse power supply (IPPS) has become a promising type of power supplies for the electromagnetic launcher (EML) [1, 2].According to electrical circuit topology, IPPS can be divided into two categories: one is the XRAM class circuit, which was first proposed by Werner Koch et al. in ...

With the rapid development of electromagnetic materials, the development of inductive energy storage is rapid. Compared with capacitive energy storage, inductive energy storage has the advantages of high energy density ratio, small volume, light weight, easiness in miniaturization, higher energy utilization rate and pulse power, and can be widely applied to the fields of ...

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 exited by discharge. Their operations are possible by using only a closing switch. Many practical and commercial switches have been already developed. ...

inherent time constant of the inductors and the output power density of the battery cell should be increased. 1 | INTRODUCTION Due to its advantage of energy density, inductive pulse power supply (IPPS) has become a promising type of power ...

A laboratory repetitive inductive storage power supply (IPS) for the ignition of an electrothermal chemical (ETC) gun is described. ... consisting of a high energy storage pulse power capacitor ...

Abstract: The all-solid-state inductive energy storage pulse forming line modulator is a brand-new solution to achieve a high repetition rate, high voltage gain, and short pulse output. However, ...

proposes a multiphase interleaved pulse power supply with energy recovery and inductive storage (MIEF-PPS). The basic concept of the topology is the inclusion of a multiphase converter with ...

By adopting a simple inductive energy storage (IES ... All the probes had a bandwidth larger than 50 MHz and an accuracy of 0.1%. The direct current (DC) power supply could provide a voltage of up to 30 V and a current of up to 60 A, with a voltage accuracy of 0.01 V. ... the discharge circuit transfers the power pulse to the thruster to ...

This paper proposes a multiphase interleaved pulse power supply with energy recovery and inductive storage (MIEF-PPS). The basic concept of the topology is the inclusion ...

In the capacitor energy storage pulse power module, the modulated inductor is equivalent to the MA-class pulse current strong magnetic field source, which will interfere with the electromagnetic ...

given in Fig. 5 has the energy storage capability of 0.5 MJ and energy storage density of 2.54 MJ/m 3, while C-based PPS with the same amount of stored energy has 1 MJ/m 3 energy storage density ...

Pulsed current generators using inductive energy storage (IES) can satisfy this demand, ... a power supply system for a vacuum-arc ion source with a millisecond pulse length was proposed. The power supply system for the vacuum-arc ion source was intended to generate pulses with a length up to 2000 µs at an accelerating voltage up to 50 kV. The ...

an ultra-short-pulse power supply NAOHIRO SHIMIZU, SOUZABURO HOTTA, TAKAYUKI SEKIYA and OSAMU ODA* NGK Insulators, Ltd., 2-56 Suda-cho, Mizuho-ku, Nagoya, 467-8530, Japan ... [4, 5], and an inductive energy storage (IES) circuit invented and developed by Iida et al. [6, 7] and applied in several ways by Jiang et al. [8]. SIThys are Si devices

inductive energy storage, inductive pulsed power supply, meat grinder, XRAM. I. INTRODUCTION ITH the advantages of high muzzle velocity and low money cost, the electromagnetic railguns have become a research focus in the field of military equipment [1]-[4]. The whole system is generally composed of the pulsed power supplies (PPSs) and the ...

Pulsed power refers to the science and technology of accumulating energy over a relatively long period of time and releasing it as a high-power pulse composed of high voltage and current over short period of time; as such, it has extremely high power but moderately low energy [2, 17, 18]. Pulsed power is produced by transferring energy ...

A current multiplier by inductive storage (CMIS) is the pulsed-power supply generating a large current pulse by adding the low currents in a lot of storage inductors which can be switched with the ...