Numerical simulation of heat dissipation in energy storage chassis

This paper presents the numerical analysis of the transient performance of the latent heat thermal energy storage unit established on finite difference method. The ...

Today, energy and environmental issues have become more and more prominent. Compared with traditional fuel vehicles, electric vehicles can effectively reduce their dependence on petroleum resources and alleviate energy and environmental pressure [1,2].Therefore, electric vehicles can be said to be a more energy-saving and ...

This paper focuses on the thermal management and heat dissipation attributes of a lithium-ion battery assembly within a military hybrid armored vehicle stationed at an altitude of 4000 m. ... et al. Numerical simulation and optimal design of air cooling heat dissipation of lithium-ion battery energy storage cabin. J Phys: Conf Ser IOP Publ ...

Considering the control equations of heat generation-heat dissipation and plate-cylinder convection heat transfer, the virtual simulation of the energy change of the ventilated brake disc ...

A. Kostina et alii, Frattura ed Integrità Strutturale, 27 (2014) 28-37; DOI: 10.3221/IGF-ESIS.27.04 31 Stored energy calculation Fig. 4 presents field of heat dissipation rate on the small area ...

Numerical simulation programs were developed for estimating temperature field and snow depth on a snow-melting system using geothermal energy assisted by heat storage during seasons.

Article "Numerical Simulation and Optimal Design of Air Cooling Heat Dissipation of Lithium-ion Battery Energy Storage Cabin" Detailed information of the J-GLOBAL is an ...

Encapsulated phase change thermal energy storage systems have promising applications in areas such as solar energy, wind energy, and heat dissipation ...

With rapid economic advancement and increasing energy consumption in China, the nation faces a growing challenge in balancing energy supply and demand [1].Annually, China generates a significant amount of industrial waste heat (IWH), representing a substantial resource for recycling [2].If IWH is exploited judiciously, it has ...

This paper proposes an approach to optimize the effect of air-cooling heat dissipation structure for electric vehicle lithium-ion battery pack through CFD simulation and Genetic Algorithm.

Inspired by the ventilation system of data centers, we demonstrated a solution to improve the airflow distribution of a battery energy-storage system (BESS) ...

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This chapter describes and illustrates various numerical approaches and methods for the modeling, simulation, and analysis of sensible and latent thermal energy storage (TES) ...

Microchannel heat sinks are widely used in the era of electronic equipment heat dissipation. This paper builds a numerical model of the heat sink with the interrupted rectangular microchannel and uses the experimental platform for validation. Two interrupted models including in-lined and staggered types are simulated to enhance the performance ...

In the field of electronics thermal management (TM), there has already been a lot of work done to create cooling options that guarantee steady-state performance. However, electronic devices (EDs) are progressively utilized in applications that involve time-varying workloads. Therefore, the TM systems could dissipate the heat generated by ...

Heat in the tank is mainly composed of heat of adsorption and heat of compression. From the figure shows that the maximum temperature and the minimum temperature are reduced, because the elevated thermal conductivity, will increase the heat dissipation, so the temperature inside the tank has been reduced. Download: Download ...

In the present research, a three-dimensional numerical simulation of the thermal efficiency of a single-stage and three-stage cascaded shell-and-tube type latent heat thermal energy storage device is carried out using various phase change materials. The mathematical model is based on the fundamental conservation laws of mass, ...

Energy storage in iron is shown to have a nonlinear character and be accompanied by wavelike heat dissipation. To describe the energy balance in the plastically deformed metal, a theoretical model ...

2 appearing in people"s view, and automotive lithium-ion batteries are developing rapidly and have the advantages of high energy density [1] and long cycle life [2].

DOI: 10.1016/j.est.2023.107511 Corpus ID: 258467591; Numerical study on heat dissipation performance of a lithium-ion battery module based on immersion cooling @article{Liu2023NumericalSO, title={Numerical study on heat dissipation performance of a lithium-ion battery module based on immersion cooling}, author={Jiahao Liu and ...

due to the directly dissipative heat by forcing fans right on the vicinity of the high heat-generating components. The present findings not only set up a numerical heat transfer analysis of desktop computer but also provide a basis for further simulation of the associated heat transfer for more complicated situations. D 2004 Elsevier Ltd.

and (3) to obtain three different types of energy dissipation rates th the energy dissipation rates of the fish scale weir under five types of weir head h under a total of 15 working conditions are recorded in table 1, with the calculated values and energy dissipation rates of various variables. In flow-3D, the cross-section Y=-0.01m is

In this paper, a 2D numerical simulation model was developed in FLUENT base on a new type thermal energy storage equipment. The results showed that the form of vertical pipes with nozzle holes can ...

Aerodynamic characteristics are of great significance to the fuel economy and handling the stability of electric vehicles. The battery pack of electric vehicles has a huge structure and is usually arranged in the chassis area of the vehicle, which inevitably occupies the space at the bottom of the vehicle and affects the aerodynamic ...

Article "Numerical Simulation and Optimal Design of Air Cooling Heat Dissipation of Lithium-ion Battery Energy Storage Cabin" Detailed information of the J-GLOBAL is an information service managed by the Japan Science and Technology Agency (hereinafter referred to as "JST"). It provides free access to secondary information on researchers, ...

In a solid resilient tire, heat generates mainly due to internal molecular frictions of rubber material which lead to strain energy dissipation. This strain energy dissipation occurs due to the material loading and unloading process when the tire is rolling and it is known as energy loss or hysteresis energy dissipation (Tang et al., 2014; Kar ...

This iteration and data exchange process is automatically repeated and not stopped until both the fluid side and the solid side models reach the convergence criteria (numerical simulation is automatically stopped when all the residuals of continuity, energy, X momentum, Y momentum, Z momentum, turbulent kinetic energy and turbulent ...

Energies 2020, 13, 106 3 of 26 2. System Description Figure 1 shows the basic structure of the proposed novel heat dissipation system (hereinafter referred to as the MHP-RC system) that can ...

1.. IntroductionThe storage of thermal energy as the latent heat of fusion of a material, namely, phase change material (PCM), has several attractive features, mainly the use of a heat that is stored in a material at a fixed temperature (i.e. melting temperature) and its high energy density [1].Latent heat thermal energy storage systems (LHTES) have ...

In recent years, in order to promote the green and low-carbon transformation of transportation, the pilot of all-electric inland container ships has been widely promoted [1].These ships are equipped with containerized energy storage battery systems, employing a "plug-and-play" battery swapping mode that completes a single ...

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The numerical method of phase change heat transfer includes the equivalent heat capacity method, enthalpy method and so on. ... Heat transfer enhancement in thermal energy storage using phase change material by optimal arrangement. Int J Therm Sci:106736. ... Zhang GQ, Ke XF et al (2017) Simulation of heat dissipation ...

A two-dimensional model is developed to simulate the transient response of a heat pipe-assisted latent heat thermal energy storage (LHTES) unit that is combined with dish-Stirling solar power generation systems. The unit consists of a container which houses a phase change material (PCM) and two sets of interlaced input and output heat ...

The OWES project (in German: Optimierte Wärmeableitung aus Energiespeichern für Serien-Elektrofahrzeuge; translated Optimized Heat Dissipation from Energy Storage Systems for Series Production Electric Vehicles), led by Audi, combines material science and production engineering research and development to focus on: ...

Costa, D. Buddhi, A. Oliva, Numerical Simulation of a Latent Heat Energy Storage System with Enhanced Heat Conduction, Energy Conversion and Management, Vol. 39, No. 3/4, (1998) 319-330. N. Leoni and C. H. ...