Pulsating heat pipe solar collector efficiency

Can a hybrid photovoltaic-thermal collector with pulsating heat pipe improve electrical efficiency?
The aim of this work is design and performance of a novel hybrid photovoltaic-thermal collector with pulsating heat pipe (PVTPHP) for improving the electrical efficiency, by reducing the photovoltaic panel's temperature, as well as taking advantage of the thermal energy produced.

Can thermal collector with pulsating heat pipe reduce temperature?
This study shows that adding thermal collector with pulsating heat pipe to PV to reduce its temperature and the use of the generated heat has a good performance. However,due to the effect of several parameters on its performance,this design is considered to be complicated.

What is pulsating heat pipe?
Pulsating Heat Pipe (PHP) is an emerging efficient heat transfer device,that transfers heat passively through oscillating motions of liquid slugs and vapor plugs within the device. PHP is of high effective thermal conductivity with great potential in heat transfer management for various applications.

Can a hybrid photovoltaic-thermal collector convert solar energy into electricity?
Comparison of variations in maximum temperature of individual PV and PVTPHP during the day The present investigation indicates the effectiveness of a novel hybrid photovoltaic-thermal collector in combination with pulsating heat pipe as a cogeneration component that converts solar energy into both electricity and heat.

Are pulsating heat pipes a good choice for heat transfer?
PHPs are now emerging as an efficient two-phase heat transfer device. The unique characteristics of Pulsating Heat Pipes,such as their structural simplicity,flexibility,high heat transfer performance,and suitability for passive operation,make them an appealing choice for various heat transfer applications.

Does a PV panel with a copper fin reduce heat transfer performance?
The data was compared with the heat transfer performance of a PV panel integrated with a solid copper fin of the same dimensions. Studies show that the surface temperature of the PV panel is reduced by 16.1°C with the use of PHP,whereas the decrease in surface temperature with copper fins is relatively lower at 4.9°C.

From the viewpoint of low cost as well as short construction schedule for the manufacturing of heat exchanger, flexibility, and high performance, Pulsating Heat Pipe (PHP) draws special...

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Heat pipes in solar collectors can be operated in any orientation. They are mechanically bonded or integral part of an absorber, receives and transfer absorbed heat to working fluid i.e. air, water or heat transfer fluid which is circulated through the manifold connected to solar collector [17].This heated working fluid can be directly or indirectly used for water/air ...

Inspired by the sunflower, we report a new structure of a solar collector that integrates a pulsating heat pipe (PHP) into a flat-plate collector.

DOI: 10.1016/J.ENERGY.2021.120751 Corpus ID: 235543750; A novel dual-diameter closed-loop pulsating heat pipe for a flat plate solar collector @article{Aref2021AND, title={A novel dual-diameter closed-loop pulsating heat pipe for a flat plate solar collector}, author={Latif Aref and Rasoul Fallahzadeh and Seyed Reza Shabanian and Mojtaba Hosseinzadeh}, ...

There are several types of heat pipes, including rotating heat pipes, wick heat pipes, thermosiphons, and pulsating heat pipes (PHPs). In solar energy systems such as Photovoltaic modules [1, 2], solar water heating systems [3, 4], solar desalination systems [5, 6], heat recovery systems [7, 8], and solar collectors [9, 10], PHPs are utilized to improve their ...

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concentrator-pulsating heat pipe solar collector (CPC-PHPSC) uses pulsating heat pipe (PHP) as an endotherm, which can realize efficient energy conversion. The design of proper concentration ratio of compound parabolic concentrator (CPC) ensures that the incident sunlight can be concentrated on the evaporator section surface of

Abstract-The primary goal of this study was to enhance the thermal efficiency of a flat plate solar collector by applying a binary mixture of acetone and water as the working ...

????PHP(Pulsating Heat Pipe)???????????SEMOHP(Self-Exciting Mode Oscil-lating-Flow Heat Pipe)?????OHP(Oscillating Heat Pipe)??????OFHP(Oscillating-Flow Heat Pipe),?????H.Akachi ?1994 ????[3]? ??????,??????????????????????[4]? ??????????????????????????? ...

This study comparatively assesses the efficiency of various single-slope solar stills employing thermosyphon and pulsating heat pipe evacuated solar collectors, integrated with phase change material. The evaporator of the thermosyphon/pulsating heat pipe system is ...

In the investigation, increasing the thermal performance of pulsating heat pipe-integrated compound parabolic solar collectors using hybrid Red Fox optimizer-based DNN. ...

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When paraffin wax is used as the heat storage material, the equivalent thermal conductivity of the pulsating heat pipe is increased by 64.9%, the thermal resistance is relatively stable, and the maximum heat collection efficiency of the collector is 79.4%.

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