High altitude balloon solar power generation

How a high-altitude solar powered balloon works?
As shown in Fig. 3, the thermal performance of high-altitude solar powered balloon is determined by three parts: solar panel, envelope and internal helium of balloon, which are interdependent and interact with each other, so there also exist internal infrared radiation and internal natural convection heat transfer between each part.

Do high-altitude solar powered scientific balloons have thermal performance?
The thermal performance of high-altitude solar powered scientific balloon is initially analyzed. The effects of the layout parameter and area of solar panel on the thermal performance of balloon are studied. A UDF program in CFD software is developed based on the thermal model of scientific balloon.

Does solar panel parameter affect thermal performance of high-altitude solar powered balloon?
In the operation process of high-altitude solar powered balloon,the parameters of solar panel,including layout and area,are not constantto execute different tasks. Therefore,we will discuss the effect of solar panel parameter on the thermal performance of high-altitude solar powered balloon in the following part.

What is the maximum temperature of a solar powered balloon?
It can be seen from Fig. 14, at 6 a.m., due to the sun at the northeast of balloon, the high temperature area locates at the northeast part of balloon. The maximum temperature of solar powered balloon, which locates at the northeast part of solar panel, is 22.4 K higher than that of un-powered balloon.

Can a solar balloon generator use wind to generate energy?
The solar balloon generator remains primarily a solar system,that can exploit wind as an integration to the energy production. Many thanks to Paola Boito (University of Limoges) for reading and revising the manuscript before the submission. Energy conversion efficiency of the pumping kite wind generator

What is the temperature difference between solar powered and un-powered balloons?
The maximum temperature of solar powered balloon,which locates at the northeast part of solar panel,is 22.4K higher than that of un-powered balloon. Fig. 15 reveals the temperature distributions at 12:00 p.m. The maximum temperature difference between solar powered and un-powered balloon reaches 40K. Fig. 14.

Still, many countries reduce their power generation decrease during winter by putting solar panels on mountain tops. 3. Utilizing Floating Solar Balloons. Solar balloons floating above the clouds ...

output of wind power generation device and the solar power generation unit, the other is with the control storage portion to ground. The cable in the selection must have high strength, low ...

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The characterized of high-altitude wind energy is fast speed, wide distribution, high stability and perennial. Utilize high-altitude wind power can get high stability with low cost of wind power ...

Keywords--high altitude wind power generation, power kites, air borne. ... The generation of electrical energy from solar and wind energy has been playing major role since the last two ...

Solar power generation using high altitude platforms feasibility and viability. G. S. Aglietti, Corresponding Author. G. S. Aglietti ... The basic concept is to exploit a high ...

Solar powered airships [44-47], renewable energies powered airships [48-50], hydrogen powered airships [51], high altitude wind power generation with airships [52], solar ...

solar power into electricity, which offers important benefits to the environment. PV systems in regions with high solar irradiation can produce a higher output but the temperature affects their ...

In 2021, solar PV power generation increased by 179 TWh, representing a year-on-year increase of 22 %, bringing the total global solar PV power generation to over 1000 TWh [3]. This ...

As shown in Fig. 2, the shape of the scientific balloon in this paper is an oblate spheroid.Based on the solar panel layout form of the fourth-generation smart balloon from Fig. ...

3. Multi-megawatt power beaming solar satellites. 4. Electric propulsion systems for Jupiter exploration. This white paper summarizes the capabilities for existing high-altitude vehicles; ...

24/7 hour production of electricity from sunlight using high altitude, solar-powered hydrogen balloons.[1] As describe in [1] and [2], they propose harvesting sunlight with solar PV panels ...

High altitude solar balloons deployed where clouds won"t interfere with their output may be the stuff of science fiction. ... a joint French/Japanese project designed to implement "next generation ... whether it ...