Natural ventilation of solar houses

What is natural ventilation in a house?

Natural ventilation in a house refers to air changes occurring naturally through doors,windows,louvers,roof ventilators and skylights. These should be located to admit fresh air only and not near sources of smoke,dust,odours or polluted air from the house.

What drives air flow through a solar house?

The driving potential for the air flow through the solar house is a function of the pressure difference between the cooling cavity inlet and the SC outlet. The buoyancy pressuredue to the increasing air temperature in the SC sucks the cooled heavy air through the cooling cavity.

Can a solar system provide good indoor conditions in a living room?

The numerical experiments show that this integrated system with proper configuration is capable of providing good indoor conditionsat the daytime in a living room even at a poor solar intensity of 200 W/m 2 and high ambient air temperature of 40 °C.

Can a solar chimney and evaporative cooling be combined?

The review of the related literature shows that the combination of both a solar chimney and an evaporative cooling which provides natural ventilation together with temperature reduction inside a building has not been investigated yet. This ventilation system has the merits of being environmentally friendly and energy saving at the same time.

Can a chimney be heated by solar energy?

A chimney heated by solar energy can be used to induce the stack effect without increasing the room temperature. The driving potential for the air flow through the solar house is a function of the pressure difference between the cooling cavity inlet and the SC outlet.

Transpired solar wall use solar energy to preheat ventilation (outdoor) air as it is drawn into a building. Transpired solar wall technology is quite simple. A dark, transpired metal wall is installed on the south-facing side of a building, ...

In this study using two low-energy systems to enhance passive cooling and natural ventilation in a solar room have been compared. First system consists of a Solar Chimney (SC) and an Evaporative... ...

Experimental investigations of the performance of the MSW showed that with 2 m height and 14.5 cm gap the MSW would produce optimum natural ventilation. The MSW can ...

A novel roof solar chimney with wind-induced channel was designed herein to augment indoor natural ventilation under combined action of wind and solar energy. Compared with the traditional...

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DOI: 10.1016/J.APPLTHERMALENG.2004.08.001 Corpus ID: 110796895; Comparison of heating and natural ventilation in a solar house induced by two roof solar collectors @article{Zhai2005ComparisonOH, title={Comparison of heating and natural ventilation in a solar house induced by two roof solar collectors}, author={Xiaoqiang Zhai and Yanjun Dai and ...

In this study a low-energy-consumption technique to enhance passive cooling and natural ventilation in a solar house, using a system consisting of a Solar Chimney (SC) ...

Among these passive ventilation solutions, design of solar chimney in buildings is a promising approach for guiding natural ventilation orderly. Many studies about solar chimneys have mainly ...

In this paper, two kinds of roof solar collectors (RSCs), namely, the single pass RSC, and the double pass RSC are analyzed and compared. The double pass roof solar collector, which is configured by integrating a double pass solar air collector with the building roof, can be operated more efficiently for space heating in winter, and for natural ventilation in other seasons.

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Ventilation can be either natural or forced. In forced ventilation, air is pushed through a building using mechanical devices like fans. On the other hand, natural ventilation uses wind and other natural factors to create airflow, such as temperature-related density differences (also known as buoyancy or the stack effect).

Transpired solar wall use solar energy to preheat ventilation (outdoor) air as it is drawn into a building. Transpired solar wall technology is quite simple. A dark, transpired metal wall is installed on the south-facing side of a building, creating approximately a (20cm-30cm) gap between it and the building"s structural wall.

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Several modes of ventilation including mechanical cooling systems, natural ventilation utilization, and hybrid systems were considered to seek the best possible option for ventilation in...

2.1 The Coupled Solar Chimney and Earth - to - Air Heat Exchanger System. A system of combined SC - EAHE for natural ventilation and cooling of a house is sketched in Fig. 1.The setup is similar to those in previous researches [4, 6].A ...

Many studies have been made in the past Chimney concept. The research in continuously going on the building of more performance analysis which will affect ventilation significantly in the residential with the use of solar energy. The literature under the broad categories of experimental, numerical modeling studies.

Experimental investigations of the performance of the MSW showed that with 2 m height and 14.5 cm gap the MSW would produce optimum natural ventilation. The MSW can reduce significantly heat gain in the house by developing air circulation to improve the thermal comfort. The proposed system was economical due to little cost of ...

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