Applied Thermal Engineering 131 (2018) 576–586

Contents lists available at ScienceDirect

Applied Thermal Engineering

journal homepage: www.elsevier.com/locate/apthermeng

Research Paper

Photonic thermal control to naturally cool and heat the building

Md. Faruque Hossain *

Department of Civil and Urban Engineering, New York University, 6 Metro Tech Center, Brooklyn, NY 11201, USA
Green Globe Technology, 4323 Colden Street 15 L, Flushing, NY 11355, USA

A R T I C L E I N F O

Article history:
Received 21 October 2017
Accepted 9 December 2017
Available online 9 December 2017

Keywords:
Decoding photon particle
Bose-Einstein photon distribution
Helium
Higgs Boson BR($H \rightarrow \gamma\gamma^-$) quantum field
Natural cooling and heating technology

A B S T R A C T

Photon particle has been modeled to be decoded by the curtain wall of the building to create a natural cooling and heating system for a building by implementing the Bose-Einstein (*B-E*) photon distribution mechanism into Helium assisted building curtain wall where the *photonic band gap state* photon will be locally induced to cool the building naturally by the cooling state of the photons. This cooling state photon, denominated as *Hossain Cooling Photon* (HcP^-). Once needed, this (HcP^-) can be transformed into thermal state photon by implementing the quantum Higgs Boson BR($H \rightarrow \gamma\gamma^-$) to create the electromagnetic field (*EmF*) using two diode thermal semiconductors. Just because Higgs boson BR ($H \rightarrow \gamma\gamma$) quantum field has extremely short range of weak force that initiates Higgs Boson BR ($H \rightarrow \gamma\gamma$) quantum get excited. Therefore, electrically charged cooling state photon (HcP^-) will be transformed into a thermal stage photon, referred to here as the Hossain Thermal Photon (HtP^-). To confirm this HcP^- formation and transformation it into HtP^-, a series of mathematical tests has been performed which revealed that formation and transformation of HcP^- and HtP^- are indeed doable to decode the photons into the curtain wall to cool and heat the building naturally.

1. Introduction

The conventional heating and cooling of a building is causing serious environmental and atmospheric impacts. Traditional heating technology consumes fossil fuels and releases CO_2, causing climate change, which triggers a deadly natural disaster on the earth and makes its environment vulnerable. On the other hand, conventional cooling technology releasing CFCs, creating holes in the ozone layers. The ozone layer lies between 9.3 and 18.6 miles (15 and 30 kms) above the Earth's surface that act as a blanket to block most of the sun's high-frequency ultraviolet rays. Due to the creation of holes in the ozone layer, UV rays are easily penetrating the surface of the earth causing deadly skin cancer to human and causing serious reproductive problems in all mammals [15,33]. Although there have been numerous studies in the past on clean energy technology, climate change, conventional heating and cooling has been performed [6,7,9,14], but no study has been done on the natural cooling and heating system in the building sectors. To avoid greenhouse gases and CFC emissions. Therefore, in this study, I proposed a natural cooling and heating technology by using Bose-Einstein photon distribution mechanism and Higgs boson Quantum activation to decode photons (solar energy) in the states of cooling and heating. To decode this photon, cooling photon emission panel consisting of *nano* point breaks and waveguides have been proposed using Helium in a portion of the exterior curtain wall [10,13]. Therefore, the quantum dynamics of photons will be cooled by the quantum electrodynamics (QED) waveguides using photon band edges (PBEs) by photon emission from the sun to cool the building naturally [20,27]. Then this cooling state photon can be transformed into a heating state photon by employing quantum Higgs boson BR ($H \rightarrow \gamma\gamma^-$) to create an electromagnetic field with the help of two diode semiconductors to naturally heat the building [3,4,8]. This cooling and heating transformation process will in indeed be a new field of science to mitigate energy, the environment and protect the ozone layer.

2. Methods and simulation

2.1. Cooling mechanism

To decode activated photon into cooling state one, photon emission networks of *nano* point breaks, waveguides, and helium assisted curtain wall will create point defects into the photon emission panel [1,12]. This would provide a mechanism for incorporation of Photonic Band Gap (PBG) waveguide defect arrays into the curtain wall [2,5]. Therefore, the quantum dynamics of photons

* Address: Department of Civil and Urban Engineering, New York University, 6 Metro Tech Center, Brooklyn, NY 11201, USA.
E-mail address: faruque55@aol.com

https://doi.org/10.1016/j.applthermaleng.2017.12.041
1359-4311/

will be decoded by point defects and PBG waveguides under helium cooling conditions. Consequently, the solar state photon will be cooled down within this regime. To calculate this detail formation of cooling state of photon conversion from sun, I have used MATLAB software to calculate detail mathematical analysis. Since the *nano* point break through helium waveguides embedded in a curtain wall, thus I have treated it as waveguides for reservoirs of photons to satisfy purely electron dynamics for cooling states of photon by considering contour maps (Fig. 1) which is can be expressed by Hamiltonian as [16,20,39]

$$H = \sum \omega_{ci} a_i^\dagger a_i + \sum_K \omega_k b_k^\dagger b_k + \sum_{ik} (V_{ik} a^\dagger b_k + V_{ik}^* b_k^\dagger a_i) \tag{1}$$

where $a_i(a_i^\dagger)$ represents the driver of the *nano* point break mode, $b_k(b_k^\dagger)$ represents the driver of the photodynamic modes of the photon *nano* structure, and the coefficients V_{ik} represent the magnitude of the photonic mode among the *nano* breakpoints and photon *nano* structure.

$$H = \sum \omega_{ci} a_i^\dagger a_i + \sum_K \omega_k b_k^\dagger b_k + \sum_{ik} (V_{ik} a^\dagger b_k + V_{ik}^* b_k^\dagger a_i) \tag{2}$$

where $a_i(a_i^\dagger)$ represents the driver of the nanoscale point break mode, $b_k(b_k^\dagger)$ represents the driver of the photodynamic modes of the nanoscale structures of the cooling photons, and the coefficient V_{ik} represents the magnitude of the cool photonic mode among the nanoscale break points and photon band structures.

Thus, the induced solar photon will be formed as HcP^- where point break photon module is built by helium by utilizing photon energy (current), a two diode and two resistors to cooling the building (Fig. 2).

More detail it can be explained by the I-V equation of photon cells for the single-diode mode by expressing as

$$\mathrm{I} = \mathrm{IL} - \mathrm{IO}\left\{\exp^{\left[\frac{q(V+I_{RS})}{AkTc}\right]} - 1\right\} - \frac{(V + I_{RS})}{R_{Sh}} \tag{3}$$

I_L represents the photon generating current, *IO* represents the saturated current in the diode, R_s represents the resistance in the series, A represents the passive function of the diode, k (= 1.38×10^{-23} W/m^2 K) represents Boltzmann's constant, q (=1.6×10^{-19} C) represents the magnitude of the charge of an electron and T_C represents the functional cell temperature. Subsequently, the I-q relationship in the photon cells varies owing to the diode current and/or saturation current, which can be expressed as [22,25]

$$\mathrm{I_O} = \mathrm{I_{RS}} \left(\frac{T_C}{T_{ref}}\right)^3 \exp\left[\frac{qEG(\frac{1}{T_{ref}} - \frac{1}{T_C})}{KA}\right] \tag{4}$$

where I_{RS} represents the saturation current, considering the functional temperature and solar irradiance speed, and *qEG* represents

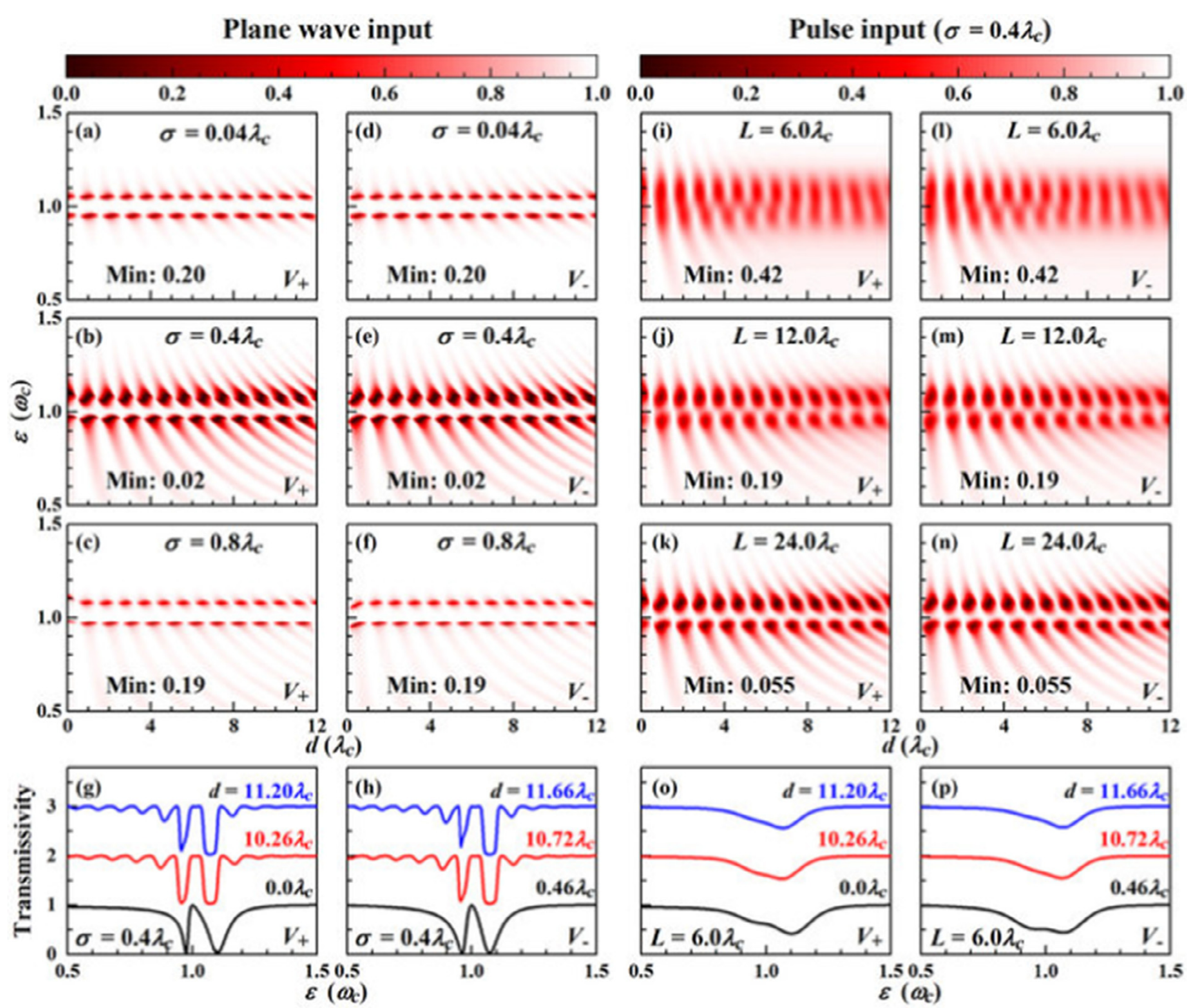

Fig. 1. Contour maps of the transmissivity of the single photon (a–f) plane wave and (i–n) pulse as functions of *d* and ε. Transmission spectra for the (g,h) plane wave and (o,p) pulse for different values of *d*, offset in steps of 1 denoted in the figures.