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Application of Computer Modelling in Building Design to Breakdown the Bose-Einstein Non-Energy State Photonic Structure into Energy State Photon to Produce Clean Energy

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Abstract

Bose-Einstein photon distribution theory is being remodelled to convert a single photon into multiple (81) photons by the activation of this discrete photonic bandgap (PBG) at the *nanoscale* to transform this photon into energy state photons. Subsequently, the quantum dynamics of these dormant photons are being activated under the condition of extreme point break photon dynamics state since this adverse condition will not obey the Bose-Einstein photon distribution theory and thus, the dormant state photon will be broken down, here named as Hossain nonequilibrium photons (HnP^-). To calculate the energy conversion from this HnP^-, a detailed model considering a single diode electricity transformation mechanism has been performed which suggested if only a mere 0.33 m^2 of a building's curtain wall is designed as an extreme PV panel, it will trap sufficient solar irradiance to transform enough electricity to meet the net energy demand for a building of 32-meter x 31-meter footprint with the height of 30 meters.

Keywords: Bose-Einstein Dormant Photons, Dormant Photon Remodeling, Photonic Band Gap Activation, Photon Structure Breakdown, and Clean Energy Production

Introduction

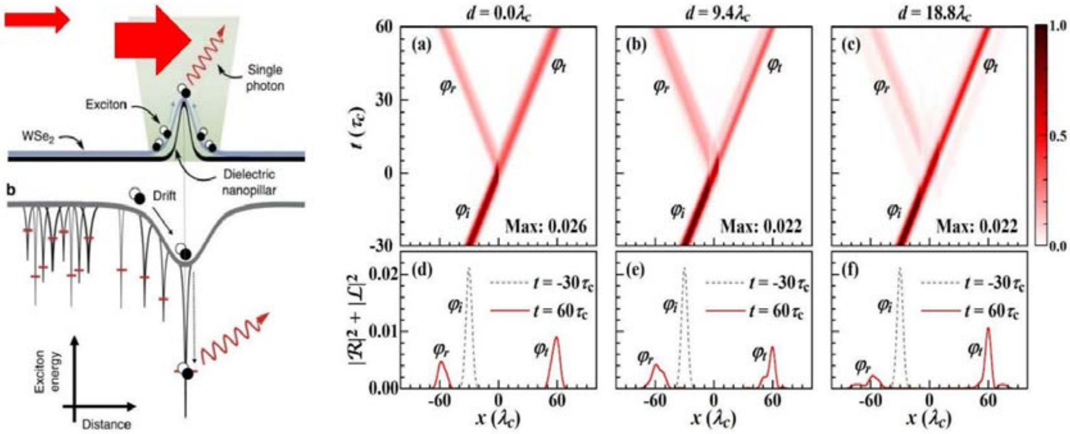
The Bose-Einstein dormant photonic structure has been remodeled by using the MATLAB software to produce trap solar energy much more efficiently by the activation of this photonic bandgap implementing high-temperature conditions is in a high thermal condition, it will not obey Bose-Einstein discrete energy state theory. Therefore, the photonic bandgap volume will be naturally increased within its vicinity as a result the high thermal condition will occur, and the discrete energy state photon will be agitated by high thermal conditions. Consequently, the Bose-Einstein photonic dormant state will be broken down within its region and will create energy state photons. Simply, the discrete energy state photon will be transformed into a non-equilibrium state energy photon to exponentially, here named Hossain nonequilibrium photons (HnP^-). Calculations reveal that if only 0.00008% of a building's exterior skin curtain wall is used as a Modern Solar Photovoltaics Energy panel to transform discrete Bose-Einstein equilibrium photons into energy state HnP^-, it will produce tremendous clean energy to satisfy the total energy demand of a building.

Methods

The modeling of the photon dynamics was conducted at the nanoscale via point break waveguides rooted within a photovoltaic semiconductor circuit using building exterior curtain wall skin is being conducted [2,12,26]. For this calculation, the photovoltaic semiconductor has been treated as waveguides for photons reservoirs [18,22,25]. Subsequently, within the photovoltaic panel of building exterior curtain wall skin, the *nano* point break flaws, purely, fulfil electronic dynamics for unceaa sing conditions of photon at atomic spectra has been mapped and expressed by Hamiltonian equation as follows:

$$H = \sum \omega_{ci}\, a_i^{\dagger} a_i + \sum_K \omega_k\, b_k^{\dagger} b_k + \sum_{ik}\left(V_{ik} a^{\dagger} b_k + V_{ik}^{*} b_k^{\dagger} a_i\right) \quad \text{.................................... (1)}$$

Where $a_i(a_i^{\dagger})$, is the nano point break mode driver; $b_k(b_k^{\dagger})$ is the driver of the photon nano structure photodynamic modes, and V_{ik} is the photonic mode magnitude amid the photon *nano* structure and *nano* breakpoints [1,11,13].



(A) (B)

*Figure 1. (A) The photonic mode for conversion of excited state energy in respect distance of the photonic frequencies, (B) (a–c) Contour maps of the photon probability densities, normalized to their maximum values in the maps as functions of x and t. (**d–f**) Probability distributions of the incident (φ_i), reflected (φ_r), and transmitted (φ_t) pulses.*

Considering into account the first descrete non-energy state Bose-Einstein photonic structure as within an equilibrium condition, the entire photonic reservoir structure is the building exterior curtain wall skin is been modelled considering the photovoltaic semiconductor on it and expressed as the below equation [5,7,9];

$$\rho(t) = -i\,[H_c'(t), \rho(t)] + \sum_{ij}\{k_{ij}(t)[2a_j\rho(t)a_i^{\dagger} - a_i^{\dagger}a_j\rho(t) - \rho(t)a_i^{\dagger}a_j] + k_{ij}(t)[a_i^{\dagger}\rho\,(t)a_j + a_j\rho(t)a_i^{\dagger} - a_i^{\dagger}a_j\rho(t) - \rho(t)a_ja_i^{\dagger}]\} \quad \text{.. (2)}$$

Here, $\rho(t)$ is the photons attenuated density within breakpoint conditions; $H_c'(t) = \sum_{ij} \omega_{cij}'(t) a_i^\dagger a_j$ is the point break re-standardized Hamiltonian with reference to the frequencies of point break $\omega_{cii}'(t) = \omega_{ci}'(t)$, as well as $\omega_{cij}'(t)$, which is the function instigated induced photons couplings amid the breakpoints (3,14,25). The factors $\tilde{\kappa}_{ij}(t)$ and $\kappa_{ij}(t)$ are considered a photonic dynamic within the photovoltaic semiconductor beneath the maximum relativistic states (4,6,10). The non-perturbative principle is purely the one that resolves time-reliant factors $\tilde{\kappa}_{ij}(t)$ and $\kappa_{ij}(t)$ and ω_{cij}'. In the case of photon reservoir, Hamiltonian is represented by $H_I = \sum_k \lambda_k x q_k$, with q_k and x being the secondary pointbreak reservoir and the primary exclusive point break location respectively [10,15]. Taking into account a photon quantum dynamics in energy state, the entire Hamiltonian reservoir point break is revised is being modelled as $H_I = \sum_k V_k\left(a^\dagger b_k + b_k^\dagger a + a^\dagger b_k^\dagger + ab_k\right)$ to approve the photonic dynamics magnitude in the point break. As a result, it has been characterized as the energy state photonic dynamics and which has been modelled as:

$$\omega_c'(t) = -Im[u(t,t_0)/u(t,t_0)] \quad (3)$$

$$k(t) = -Re[u(t,t_0)/u(t,t_0)] \quad (4)$$

$$\hat{k}(t) = \dot{v}(t,t) + 2v(t,t)\,k(t) \quad (5)$$

With reference to the above equations, $u(t,t_0)$ is the photonic region of the point break; and $v(t,t)$ is the photon dynamics as a result of the induced reservoir. The function $v(t,t)$ is explained further by the use of non-equilibrium dynamics theory and the following integral-differential equation [21,23]:

$$\dot{u}(t,t_0) = -i\omega_c u(t,t_0) - \int_{t_0}^{t} dt' g(t-t')\, u(t^t,t_0) \quad (6)$$

$$v(t,t) = \int_{t_0}^{t} dt \int_{0}^{t} dt_2\, u^*(t_1,t_0)\hat{g}(t_1-t_2)\, u(t_2,t_0) \quad (7)$$

The number of energy state photons generated by the non- stable condition is exceptionally expressed per *unit* area of the photonic structure $J(\varepsilon)$ via the following connections as $g(t-t') = \int d\omega J(\omega) e^{-i\omega(t-t')}$ and $\tilde{g}(t-t') = \int d\omega J(\omega)\bar{n}(\omega,T)\, e^{-i\omega(t-t')}$, Where, in this case, $\bar{n}(\omega,T) = 1/\left[e^{\hbar\omega/k_B T} - 1\right]$, is the primeenergy photon dynamics within the photovoltaic panel at a temperature (*T*). The clarification the unit area $J(\varepsilon)$ is done in connection to the density of states $\varrho(\omega)$ production of photon within the photovoltaic at the V_k magnitude amid the photovoltaic and point break circuits;

$$J(\omega) = \sum_k |V_k|^2\, \delta(\omega - \omega_k) = \varrho(\omega)\,|V(\omega)|^2 = [n * e(1+2n)]^4 \quad (8)$$

Finally, the summary of the energy state photon production is being calculated with regard to the condition of photon dynamic within the photovoltaic panel consedirng the exterios courtain wall skin of the building, so that as the production of the non-equilibrium energy state photon ($J(\omega)$ can be simplied as:

$$J(\omega) = [n * e(1+2n)]^4 \quad (9)$$

Results

The results revealed that the generation of *HnP⁻* in the curtain wall skin of the building exterior wall is suggestively produced from the discrete Bose-Einstein photon dissemination breakdown and transformation into energy state photons within the photovoltaic panels is viable regarding the photons proliferation conditions, which is modelled as below:

$$\rho(t) = \mathcal{D}[\alpha(t)]\rho_T[v(t,t)]\mathcal{D}^{-1}[\alpha(t)] \quad (10)$$

Where $\mathcal{D}[\alpha(t)] = exp\{\alpha(t)\alpha^{\dagger} - \alpha^{*}(t)\alpha\}$ represents the displacement driver with $\alpha(t) = u(t,t_0)\alpha_0$ and

$$\rho_T[v(t,t)] = \sum_{n=0}^{\infty} \frac{[v(t,t)^n]}{[1+v(t,t)]^{n+1}} |n\rangle\langle n| \quad (11)$$

From the above equation, ρ_T denotes the thermal condition with mean practical number $v(t,t)$, with Eq.11 disclosing that the prime point break cavity condition will transform into a displaced thermal condition (19,24), which represents the combination of displaced number conditions $\mathcal{D}[\alpha(t)]|n\rangle^{37}$. As a result Eq.11 can as well be rewritten as follows:

$$\langle m|\rho(t)|n\rangle = J(\omega) = e^{-\Omega(t)|\alpha_0|^2} \frac{[\alpha(t)]^m[\alpha^*(t)]^n}{[1+v(t,t)]^{m+n+1}} = \sum_{k=0}^{min\{m,n\}} \frac{\sqrt{m!n!}}{(m-k)!(n-k)!k!} \left[\frac{v(t,t)}{\Omega(t)|\alpha_0|^2}\right]^k \quad (12)$$

Here, the *HnP*- production within the photovoltaic panel ($\langle m|\rho(t)|n\rangle$) will certainly transform into a non-equilibrium state $[\alpha(t)]^m[\alpha^*(t)]^n$ and an extreme relativistic thermal condition $[1 + v(t,t)]^{m+n+1}$.This clearly recommends that the photonic band photon number shall not comply with the Bose-Einstein distribution, instead it produces the photon exponentially $J(\omega) = \sum_{k=0}^{min\{m,n\}} \frac{\sqrt{m!n!}}{(m-k)!(n-k)!k!} \left[\frac{v(t,t)}{\Omega(t)|\alpha_0|^2}\right]^k = [n * e(1+2n)]^4$ ....(13)

Finally, the total photon production from a single photon is calculated as, $J(\omega) = [n * e(1 + 2n)]^4$. Therefore, the total number of photons would be 81 photons, which originate from a single photon. Then, I performed an estimate to convert these photons into electricity. The light quanta of a certain type of polarization have a frequency range of ν_r to $\nu_r + d\nu_r$; thus, the maximum solar radiation is achieved from 81 photons at 1.4 eVx81=113.4 eV (one photon is 1.4 eV). Therefore, the total energy would be (1.4 eV = 27.77 mW/m^2 x 81) 2249.37 mW/m^2 · eV per hour [8,16,20]. The electricity produced at this stage is DC (direct current) that must be converted to AC (alternating current) for use in the building sector and battery system storage. The estimate reveals that in a year with an average of five hours a day maximum for 365 days, this total energy production is equivalent to 4,105,100.25 kW/year [17,24)]. This means that 11,246.85 kW of energy can be supplied by a 1 m^2 solar panel per day. If an office and commercial building consumption is approximately 3,800 kWh/day for a building with a 32 m x 31 m footprint and height of 30 m (10 floors), 0.33 m^2 of the building's exterior skin must be used as solar panels to meet the total energy demand of the building, which is equivalent to 0.00008% of the exterior curtain wall.

Conclusions and Contributions

Bose-Einstein photon distribution theory is broken down theoretically under high temperature condition to create HnP^- and produce clean energy. A series of mathematical calculations have been performed to confirm the production of multiple HnP^- from a single Bose-Einstein dormant photon under high temperature conditions in the PV panel. Mathematical analyses suggest that high temperature conditions break down the Bose-Einstein dormant photons and produce nearly exponential rate photons from an equilibrium to a non-equilibrium stage. The results suggest that the proliferation of these photons is agitated by the high temperature condition to conduct photon-photon interactions in the PV panel to exponentially produce photons. Naturally, these created photons can be captured by the PV circuit system to produce DC current and then convert it into AC current to satisfy the energy demand of a building. The energy production from the PV panel has also been calculated, which revealed that if only a mere 0.00008% of a building exterior curtain wall is used as a Modern Solar Photovoltaics Energy panel, it will meet the total energy demand of the building using 100% clean energy. Naturally, implementation of this technology would introduce a new era of science to meet the total energy demand of the building sector and dramatically reduce climate change.

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