Optical Wired/Wireless Communication Using Soliton Optical Tweezers

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Abstract: The aim of this study is to generate nano optical tweezers to be connected to an optical quantum signal processing system in order to transmit quantum photon via an optical communication link. A system of microring resonator (MRR) known as Half-Panda is proposed to generate nano optical tweezers. Optical tweezers can be used to transport molecules in a communication link. The dark soliton propagates inside nonlinear MRR. Transportation of molecules or photons is implemented when the dark soliton is used as input pulse. The input Gaussian soliton is used to control the output signal at the through and drop ports of the system. Output nano optical tweezers can be connected to the quantum signal processing system consisting of a receiver and transmitter. The receiver will detect the signals of optical tweezers and transmit them via wired/wireless as quantum bits. The transmitter will generate the entangled photon pair which propagates via an optical communication link. Here the smallest nano optical tweezers signals with width at half maximum (FWHM) of 4.2 nm is obtained where the free spectrum range (FSR) of 50 nm is simulated.

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1.0 INTRODUCTION

Dark-Gaussian soliton controls within a semiconductor add/drop multiplexer has numerous applications in optical communication (Amiri *et al.* 2010a; I. S. Amiri and J. Ali). Nano optical tweezers technique has become a powerful tool for manipulation of micrometer-sized particles/photons in three spatial dimensions (Amiri and Ali 2012; Sadegh Amiri *et al.* 2013). It has the unique ability to trap and manipulate molecules/photons at mesoscopic scales with widespread applications in biology and physical sciences (I. S. Amiri and Ali 2013; Amiri and Ali 2013b). The output is achieved when the high optical field is set up as an optical tweezers (Afroozeh *et al.* 2010d; Imran *et al.* 2010; Nikoukar *et al.* 2013). For communication's application purposes, the optical tweezers can be used to generate entangled photon within the proposed network system (Amiri *et al.* 2013c; Nikoukar *et al.* 2012; Kouhnavard *et al.* 2010c; Amiri *et al.* 2012f).

The tweezers in the forms of valleys or potential wells are kept in the stable form within the add/drop filter (Amiri and Ali 2013c; Ali *et al.* 2010v; Amiri *et al.* 2010b). MRR's are type of Fabry-Perot resonators which can be readily integrated in array geometries to implement many useful functions (Amiri *et al.* 2011d; Shahidinejad *et al.* 2012; Nikoukar *et al.* 2010-2011). Its nonlinear phase response can be readily incorporated into an interferometer system to produce specific intensity output function (Amiri *et al.* 2012b; Afroozeh *et al.* 2010c; I. S. Amiri and J. Ali 2014c). Several emerging technologies, such as integrated all optical signal processing and all-optical quantum information processing (Kouhnavard *et al.* 2010a; Ali *et al.* 2010s; Ali *et al.* 2010y), require interactions between two distinct optical signals (Amiri *et al.* 2013e; Amiri *et al.* 2011a; I. S. Amiri *et al.* 2013b).

Internet security becomes an important function in the modern internet service (Amiri *et al.* 2012l; Amiri *et al.* 2011b). However, the security technique known as quantum cryptography has been widely used and investigated in many applications, using optical tweezers (Amiri *et al.* 2012g; Amiri *et al.* 2012n). Amiri *et al.* have proposed the new design of secured packet switching (Amiri *et al.* 2012d; I. S. Amiri *et al.* 2013d; I. S. Amiri *et al.* 2013e). This method uses nonlinear behaviors of light in MRR which can be used for high-capacity and security switching (I. S. Amiri and J. Ali 2014b; Afroozeh *et al.* 2011a). Recently quantum network shows promising usage for the perfect network security (Gifany *et al.* 2013; Amiri *et al.* 2010-2011). Amiri *et al.* have shown that the continuous wavelength can be generated by using a soliton pulse in a MRR (Amiri *et al.* 2013b; I. S. Amiri *et al.* ; Amiri and Ali 2013d). The secret key codes are generated via the entangled photon pair which is used to security purposes using the dark soliton pulse propagation (Amiri *et al.* 2011c; Amiri *et al.* 2012e; Shojaei and Amiri 2011a). In this study, a nano molecular cryptography system based on optical soliton is developed.

2.0 THEORETICAL MODELING

The dark soliton pulse is introduced into the multiplexer half-Panda system shown in figure (1). This system consists of an add/drop filter system connected to a smaller ring resonator on the right side (I. S. Amiri *et al.* 2014; Amiri *et al.* 2012p). Dynamic behavior of the optical tweezers is appeared when the Gaussian soliton is input into the add port of the system . The ring resonator is connected to the add-drop interferometer system with radius (R_{ring}) of 10 μm and coupling coefficient (κ) of 0.5. The effective area of the coupling section is A_{eff}=0.25 μm^2.

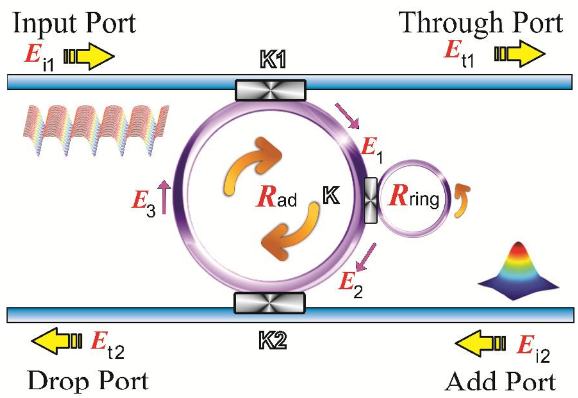

Fig.1. A schematic diagram of Half-Panda system

The input optical field (E_{i1}) of the dark soliton and add optical field (E_{i2}) of the Gaussian pulses are given by (Amiri and Ali 2014b; Amiri *et al.* 2012k; Afroozeh *et al.* 2012b)

$$E_{i1} = A\tanh\left[\frac{T}{T_0}\right]\exp\left[\left(\frac{z}{2L_D}\right)-i\omega_0 t\right], \quad (1)$$

$$E_{i2}(t) = A\exp\left[\left(\frac{z}{2L_D}\right)-i\omega_0 t\right] \quad (2)$$

In equations (1) and (2), A and z are the optical field amplitude and propagation distance, respectively (Afroozeh *et al.* 2012a; Ali *et al.* 2010h; Ali *et al.* 2010j). T is defined as soliton pulse propagation time in a frame moving at the group velocity (Amiri *et al.* 2012i; Ali *et al.* 2010e; Amiri *et al.* 2010c; Ali *et al.* 2010b), $T = t-\beta_1\times z$, where β_1 and β_2 are the coefficients of the linear and second order terms of Taylor expansion of the propagation constant (I. S. Amiri *et al.* 2013a; Shojaei and Amiri 2011b). $L_D = T_0^2/|\beta_2|$ represents the dispersion length of the soliton pulse (Afroozeh *et al.* 2012c; Ali *et al.* 2010z; Ali *et al.* 2010g). The carrier frequency of the soliton is ω_0 (Kouhnavard *et al.* 2010b; Mohamad *et al.* 2010b; Ali *et al.* 2010l; Ali *et al.* 2010x). When a soliton pulse keeps its temporal width invariance as it propagates, it is called a temporal soliton (A. Shahidinejad *et al.* 2014). T_o is known for the intensity of soliton peak as $\left(|\beta_2/\Gamma T_0^2|\right)$ (Afroozeh *et al.* 2011b; Ali *et al.* 2010c; Ali *et al.* 2010u). A balance should be achieved between the dispersion length *(L_D)* and the nonlinear length *(L_{NL}= (1/$\gamma\varphi_{NL}$))* (Amiri *et al.* 2013f), where γ and φ_{NL} are the coupling loss of the field amplitude and nonlinear phase shift (Amiri *et al.* 2012o; Ali *et al.* 2010p; Ali *et al.* 2010o; Afroozeh *et al.* 2010b). They are the length scale over which dispersive or nonlinear effects makes the beam becomes wider or narrower (I. S. Amiri and J. Ali 2014a; Ali *et al.* 2010a; Ali *et al.* 2010r; Ali *et al.* 2010n). It means that the L_D=L_{NL} should be satisfied (Amiri *et al.* 2013a; Yupapin *et al.* 2010). Within the nonlinear medium, the refractive index (n) changes according to given following equation (3) (Amiri and Ali 2013a; Amiri *et al.* 2012a),

$$n = n_0 + n_2 I = n_0 + \left(\frac{n_2}{A_{eff}}\right)P, \quad (3)$$

n_0 and n_2 are the linear and nonlinear refractive indexes, respectively (Amiri *et al.* 2012j). I and P represent the optical intensity and optical power, respectively (I. S. Amiri *et al.* 2013c; Ridha *et al.* 2010a; Ali *et al.* 2010q; Ali *et al.* 2010f). The effective mode core area of the device is given by A_{eff} (Amiri and Ali 2014a). In figure (1), the resonant output is formed, thus, the normalized output of the light field is the ratio between the output and input fields E_{out} (t) and E_{in} (t) (Ali Shahidinejad *et al.* 2014; Suwanpayak *et al.* 2010). The output and input signals in each roundtrip of the ring resonator on the right side can be calculated using equation (4) (Afroozeh *et al.* 2012d; I. S. Amiri and J. Ali 2014d).

$$\left|\frac{E_{out}(t)}{E_{in}(t)}\right|^2 = (1-\gamma)\left[1-\frac{(1-(1-\gamma)x^2)\kappa}{(1-x\sqrt{1-\gamma}\sqrt{1-\kappa})^2+4x\sqrt{1-\gamma}\sqrt{1-\kappa}\sin^2(\frac{\phi}{2})}\right] \quad (4)$$

Therefore ring resonator can be comparable to a Febry-Perot cavity (Jalil *et al.* 2010). It has an input and output mirror with a field reflectivity, (1-κ), and a fully reflecting mirror (Afroozeh *et al.* 2010a; Saktioto *et al.* 2010c). Here κ is the coupling coefficient, and *x=exp(-αL/2)* represents a roundtrip loss coefficient (Saktioto *et al.* 2010b; Ridha *et al.* 2010b), Φ_0=kLn_0 and Φ_{NL}=$kLn_2|E_{in}|^2$ are the linear and nonlinear phase shifts (Ali *et al.* 2010d; Mohamad *et al.* 2010a; Ali *et al.* 2010w), k=$2\pi/\lambda$ is the wave propagation number in a vacuum (Teeka *et al.* 2011; Saktioto *et al.* 2010a; Ali *et al.* 2010k). L

and α are a waveguide length and linear absorption coefficient, respectively (Jalil *et al.* 2011; Amiri *et al.* 2012c). In this work, the iterative method is inserted to obtain the needed results using equation (4). Two complementary optical circuits of a ring-resonator add-drop filter can be expressed by the equations (5) and (6) (Amiri and Ali 2014c; Ali *et al.* 2010t).

$$\left|\frac{E_t}{E_{in}}\right|^2=\frac{(1-\kappa_1)-2\sqrt{1-\kappa_1}\cdot\sqrt{1-\kappa_2}\,e^{-\frac{\alpha}{2}L_{ad}}\cos(k_nL_{ad})+(1-\kappa_2)e^{-\alpha L_{ad}}}{1+(1-\kappa_1)(1-\kappa_2)e^{-\alpha L_{ad}}-2\sqrt{1-\kappa_1}\cdot\sqrt{1-\kappa_2}\,e^{-\frac{\alpha}{2}L_{ad}}\cos(k_nL_{ad})} \tag{5}$$

and

$$\left|\frac{E_d}{E_{in}}\right|^2=\frac{\kappa_1\kappa_2 e^{-\frac{\alpha}{2}L_{ad}}}{1+(1-\kappa_1)(1-\kappa_2)e^{-\alpha L_{ad}}-2\sqrt{1-\kappa_1}\cdot\sqrt{1-\kappa_2}\,e^{-\frac{\alpha}{2}L_{ad}}\cos(k_nL_{ad})}, \tag{6}$$

where E_t and E_d represent the optical fields of the throughput and drop ports respectively. β=kn$_{eff}$ is the propagation constant (S. E. Alavi *et al.* 2013), n_{eff} is the effective refractive index of the waveguide and the circumference of the ring is $L_{ad}=2\pi R_{ad}$. R_{ad} is the radius of the ring. The phase constant can be simplified as $\Phi=\beta L$ (Amiri et al. 2012e; Ali *et al.* 2010i; Saktioto *et al.* 2010d). The chaotic noise cancellation can be managed by using the specific parameters of the add-drop device in which required signals can be retrieved by the specific users (I. S. Amiri *et al.* ; Ali *et al.* 2011; Ali *et al.* 2010{; Ali *et al.* 2010m). The waveguide (ring resonator) loss is $\alpha=0.5\ dBmm^{-1}$. The fractional coupler intensity loss is γ= 0.1 (Tanaram *et al.* 2011; Amiri *et al.* 2012m). In the case of add-drop device, the nonlinear refractive index is neglected. The output fields, E_{t1} and E_{t2} at the throughput and drop parts of the Half-Panda are expressed by (Bahadoran *et al.* 2011; Amiri *et al.* 2012h)

$$E_{t1}=-x_1x_2y_2\sqrt{\kappa_1}E_{i2}e^{-\frac{\alpha L_{ad}}{2}}-jk_n\frac{L_{ad}}{2}+$$
$$\left[\frac{x_2x_3\kappa_1\sqrt{\kappa_2}E_0E_{i1}(e^{-\frac{\alpha L_{ad}}{2}}-jk_n\frac{L_{ad}}{2})^2+x_3x_4y_1y_2\sqrt{\kappa_1}\sqrt{\kappa_2}E_0E_{i2}(e^{-\frac{\alpha L_{ad}}{2}}-jk_n\frac{L_{ad}}{2})^3}{1-x_1x_2y_1y_2E_0(e^{-\frac{\alpha L_{ad}}{2}}-jk_n\frac{L_{ad}}{2})^2}\right], \tag{7}$$

$$E_{t2}=x_2y_2E_{i2}+\left[\frac{x_1x_2\kappa_1\sqrt{\kappa_1}\sqrt{\kappa_2}E_0E_{i1}e^{-\frac{\alpha L_{ad}}{2}-jkn\frac{L_{ad}}{2}}+x_1x_3y_1y_2\sqrt{\kappa_2}E_0E_{i2}(e^{-\alpha\frac{L_{ad}}{2}-jk_n\frac{L_{ad}}{2}})^2}{1-x_1x_2y_1y_2E_0(e^{-\frac{\alpha L_{ad}}{2}-jk_n\frac{L_{ad}}{2}})^2}\right]. \tag{8}$$

The electric field of the small ring on the right side of the Half-Panda system is given as (A. Nikoukar *et al.* 2014; Amiri *et al.* 2013d):

$$E_0=E_1\frac{\sqrt{(1-\gamma)(1-\kappa)}-(1-\gamma)e^{-\frac{\alpha}{2}L_{ring}-jk_nL_{ring}}}{1-\sqrt{1-\gamma}\sqrt{1-\kappa}\,e^{-\frac{\alpha}{2}L_{ring}-jk_nL_{ring}}}, \tag{9}$$

where $L_{ring}=2\pi R_{ring}$ and R_{ring} is the radius of the ring and the $x_1=\sqrt{1-\gamma_1}$, $x_2=\sqrt{1-\gamma_2}$, $x_3=1-\gamma_1$, $x_4=1-\gamma_2$, $y_1=\sqrt{1-\kappa_1}$ and $y_2=\sqrt{1-\kappa_2}$.

3.0 RESULT AND DISCUSSION

Input optical dark solitons and Gaussian laser bean with powers 2W and 1W respectively are inserted into the Half-Panda system. The add-drop optical filter has radius of R_{ad} = 15 µm where the coupling coefficients are κ_1 = 0.35 and κ_2 = 0.25. The dark solitons are propagating inside the Half-Panda system with central wavelengths of λ_0 = 1.4 µm, 1.45 µm, 1.5 µm, 1.55 µm, 1.6 µm. In order to increase the capacity of the output optical tweezers, input dark soliton pulses with four different central wavelengths are introduced to the input port of the system. Figure 2(a), shows the optical inputs in the form of dark soliton and Gaussian laser beam. The nonlinear condition forms the interior signals as chaotic signals respect to 20,000 roundtrips of the input power. In order to make the system associate with the practical device (InGaAsP/InP), the selected parameters of the system are fixed to $n_0=3.34$ and $n_2=2.5\times10^{-17}$. By adjusting the parameters such as the dark and Gaussian powers at the input and add ports and the coupling coefficients, the tweezers depth would be controlled and tuned as shown in figure 2(b-d). Amplification of the signals occurs within the nonlinear system which makes the signals suitable for long distance communication.

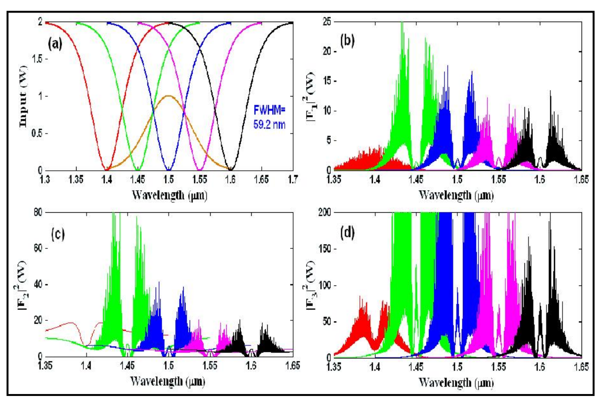

Fig.2: Optical tweezers generation within a Half-Panda system where (a): input of optical dark solitons and Gaussian laser beam, (b-d): amplified and tuned optical tweezers in the form of potential wells

Smallest tweezers width of 4.2 nm is generated at the through port shown in figure (3), where the drop port shows the output signal with FWHM of 18.5 nm. Transportation of the optical tweezers can be obtained via a network system using a photon generator and transmitter. Detection of the transported tweezers signal can be assembled using the single photon detection method. Thus, the tweezers transportation for long distance communication via molecular transporter is realistic.

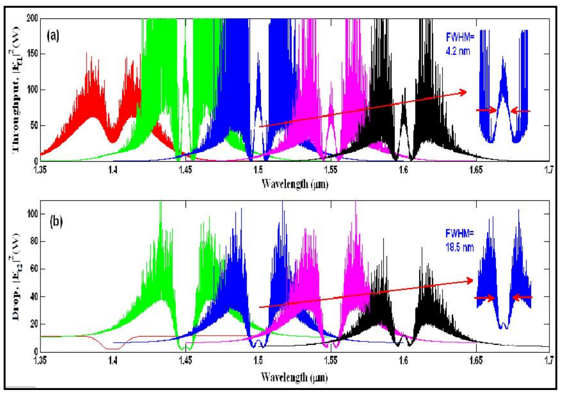

Fig.3: Through and drop port output signals of the Half-Panda system where (a): Through port output with FWHM=4.2 nm, (b): drop port output with FWHM=18.5 nm

Cancelling of the chaotic signals can be obtained within the add-drop ring resonator interferometer system using suitable parameters of the rings. The signals can be controlled and tuned by power's variation of the input Gaussian laser pulse. Figure (4) shows the generation of nano optical tweezers (clear signals). Here the input powers of the optical dark soliton pulses and Gaussian laser beam are 2W and 2.5W respectively.

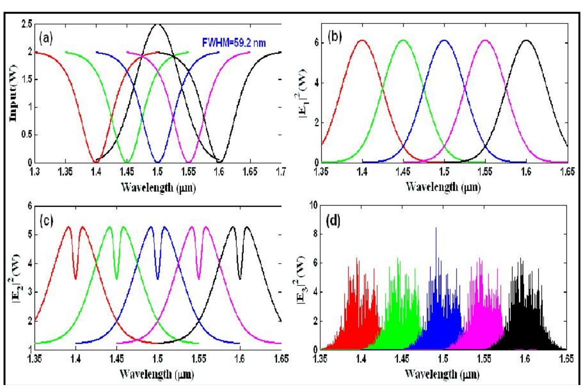

Fig.4: Optical tweezers generation within a Half-Panda system where (a): input of dark solitons and Gaussian laser beam, (b-d): tuned and controlled optical tweezers

Filtered and clear optical tweezers are seen in figure (5) where the peaks have FWHM and FSR of 8.9 nm and 50 nm respectively. In the case of communication networks, generation of narrower signals is recommended. Therefore soliton signals can be used in optical communication where the capacity of the output signals can be improved by generation of peaks with smaller FWHM. The sensitivity of the ring systems can be improved significantly by generation of peaks with wider space or bigger FSR.

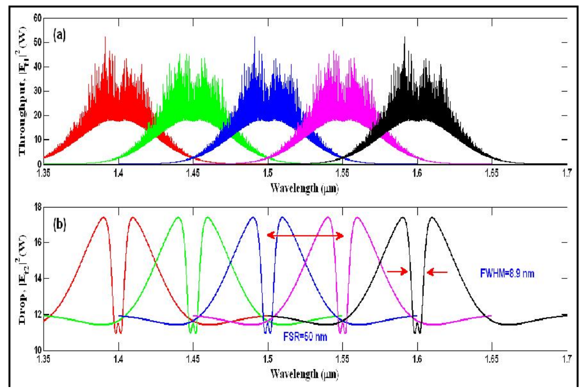

Fig.5: Through and drop port output signals of the Half-Panda system where (a): Through port chaotic output signals (b): drop port output with FWHM=8.9 nm anf FSR=50 nm

The proposed transmission unit is a quantum processing system that can be used to generate high capacity packet of quantum entanglement photons within the series of MRRs. In operation, the computing data can be modulated and input into the system via a receiver unit which is encoded to the quantum signal processing system. The receiver unit can be used to detect the quantum bits. It is obtained via the reference states recognized by using the cloning unit operated by an add-drop filter (R_{d1}) shown in figure (6).

By using suitable dark-Gaussian soliton input power, tunable optical tweezers can be controlled. This provides the entangled photon as the dynamic optical tweezers probe . The required data can be retrieved via the through and drop ports of the add-drop filter in the router. High capacity data transmission can be applied by using more wavelength carriers. The advantage of this study is that ultra-short nano optical tweezers can be generated and transmitted via a network system thus improving the security and capacity.

The polarization states of light pulses are changed and converted during the circulation in the delay circuit, leading to the formation of the polarized entangled photon pairs. The entangled photons of the nonlinear ring resonator are then separated into the signal and idler photon probability. The polarization angle adjustment device is applied to investigate the orientation and optical output intensity.

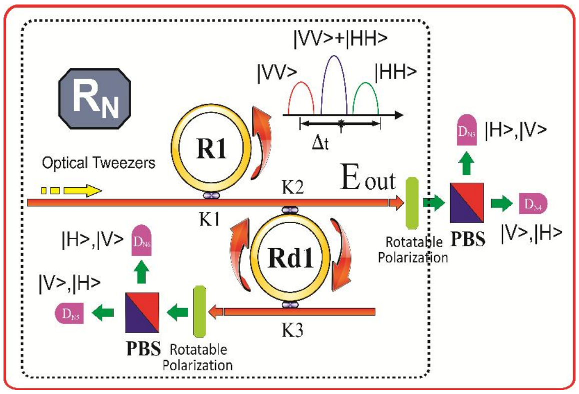

Fig.6: Schematic of entangled photon manipulation system. The quantum state is propagating to a rotatable polarizer and then is split by a beam splitter (PBS) flying to detector D_{N3}, D_{N4}, D_{N5} and D_{N6}

Transporter states can be controlled and identified using the quantum processing system as shown in Figure 6. In operation, the encoded quantum secret codes computing data can be modulated and input into the system via a wireless router. Schematic of the wireless router is shown in Figure 7, in which quantum cryptography for internet security can be obtained. A wireless router system can be used to transfer generated entangled photons via a wireless access point, and network communication system shown in Figure 7.

Fig.7: System of entangled photons transmission using a wireless access point system

A wireless access system transmits data to different users via wireless connection. This method also works in reverse, when the router system used to receive information from the Internet, translating it into an analog signal and sending it to the computer's wireless adapter. Figure 5 shows the detected and filtered optical tweezers using an optical receiver.

The advanced transmitter topologies are desirable for application in both wired and wireless communication inasmuch as they are able to provide power-efficient amplification of signals with large peak-to average power ratios (PAPRs) without compromising system linearity.

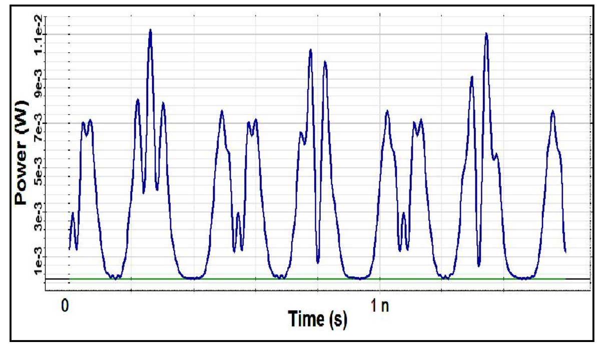

Fig.8: Detected and filtered optical tweezers via a 25 m optical wireless link using an optical receiver

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4.0 CONCLUSION

Novel system of nano optical tweezers generation is presented for cryptography and secured optical communication. Nano optical tweezers can be generated by the dark soliton propagation in a Half-Panda system. The control process of the dark-Gaussian collision can be implemented by using suitable parameters of the ring system such as the input power, coupling coefficient, ring radius, coupler loss and effective core area. The Quantum signal processing unit is connected to the optical tweezers which can be used to generate quantum entanglement photons thus providing secured and high capacity information. This secured coded information can be easily transmitted via a communication network system. Here Double security can be performed when ultra-short of soliton pulses are used to generate entangle photon transmitting over long distance communication.

REFERENCES

1. Nikoukar, A., Amiri, I.S., Shahidinejad, A., Anwar, Toni., The Proposal of High Capacity GHz Soliton Carrier Signals Applied for Wireless Commutation. Reviews in Theoretical Science 2014. Accepted.
2. Shahidinejad, A., Soltanmohammadi, S., Amiri, I.S., Anwar, T., Solitonic Pulse Generation for Inter-Satellite Optical Wireless Communication. Quantum Matter 2014; 3(2): 150-154.
3. Afroozeh, A., Amiri, I.S., Ali, J., Yupapin, P.P., Determination Of Fwhm For Solition Trapping. Jurnal Teknologi (Sciences and Engineering) 2012a; 55: 77-83.
4. Afroozeh, A., Amiri, I.S., Bahadoran, M., Ali, J., Yupapin, P.P., Simulation of Soliton Amplification in Micro Ring

Resonator for Optical Communication. Jurnal Teknologi (Sciences and Engineering) 2012b; 55: 271-277.
5. Afroozeh, A., Amiri, I.S., Jalil, M.A., Kouhnavard, M., Ali, J., Yupapin, P.P., Multi Soliton Generation for Enhance Optical Communication. Applied Mechanics and Materials 2011a; 83: 136-140.
6. Afroozeh, A., Amiri, I.S., Kouhnavard, M., Bahadoran, M., Jalil, M.A., Ali, J., Yupapin, P.P.: Dark and Bright Soliton trapping using NMRR. Paper presented at the International Conference on Experimental Mechanics (ICEM), Kuala Lumpur, Malaysia, 29 November-1 December (2010a).
7. Afroozeh, A., Amiri, I.S., Kouhnavard, M., Bahadoran, M., Jalil, M.A., Ali, J., Yupapin, P.P.: Optical Memory Time using Multi Bright Soliton. Paper presented at the International Conference on Experimental Mechanics (ICEM), Kuala Lumpur, Malaysia, 29 November-1 December (2010b).
8. Afroozeh, A., Amiri, I.S., Kouhnavard, M., Jalil, M., Ali, J., Yupapin, P., Optical dark and bright soliton generation and amplification. AIP Conference Proceedings 2010c; 1341: 259-263.
9. Afroozeh, A., Amiri, I.S., Samavati, A., Ali, J., Yupapin, P.: THz frequency generation using MRRs for THz imaging. In: International Conference on Enabling Science and Nanotechnology (EsciNano), Kuala Lumpur, Malaysia 2012c, pp. 1-2. IEEE Explore.
10. Afroozeh, A., Bahadoran, M., Amiri, I.S., Samavati, A.R., Ali, J., Yupapin, P.P.: Fast Light Generation Using Microring Resonators for Optical Communication. Paper presented at the National Science Postgraduate Conference, NSPC, Universiti Teknologi Malaysia, 15-17 November (2011b).
11. Afroozeh, A., Bahadoran, M., Amiri, I.S., Samavati, A.R., Ali, J., Yupapin, P.P., Fast Light Generation Using GaAlAs/GaAs Waveguide. Jurnal Teknologi (Sciences and Engineering) 2012d; 57: 17-23.
12. Afroozeh, A., Kouhnavard, M., Amiri, I.S., Jalil, M.A., Ali, J., Yupapin, P.P.: Effect of Center Wavelength on MRR Performance. In: Faculty of Science Postgraduate Conference (FSPGC), Universiti Teknologi Malaysia, 5-7 OCTOBER 2010d.
13. Ali, J., Afroozeh, A., Amiri, I.S., Hamdi, M., Jalil, M., Kouhnavard, M., Yupapin, P.: Entangled photon generation and recovery via MRR. Paper presented at the ICAMN, International Conference, Prince Hotel, Kuala Lumpur, Malaysia, 29 Nov-1 Dec (2010a).
14. Ali, J., Afroozeh, A., Amiri, I.S., Jalil, M., Yupapin, P.: Wide and narrow signal generation using chaotic wave. Paper presented at the Nanotech Malaysia, International Conference on Enabling Science & Technology, Kuala Lumpur, Malaysia, 1-3 December (2010b).
15. Ali, J., Afroozeh, A., Amiri, I.S., Jalil, M.A., Kouhnavard, M., Yupapin, P.P.: Generation of continuous optical spectrum by soliton into a nano-waveguide. Paper presented at the ICAMN, International Conference, Prince Hotel, Kuala Lumpur, Malaysia 29 Nov-1 Dec (2010c).
16. Ali, J., Afroozeh, A., Amiri, I.S., Jalil, M.A., Yupapin, P.P.: Dark and Bright Soliton trapping using NMRR. Paper presented at the ICEM, Legend Hotel, Kuala Lumpur, Malaysia, 29 Nov-1 Dec (2010d).
17. Ali, J., Afroozeh, A., Hamdi, M., Amiri, I.S., Jalil, M.A., Kouhnavard, M., Yupapin, P.: Optical bistability behaviour in a double-coupler ring resonator. Paper presented at the ICAMN, International Conference, Prince Hotel, Kuala Lumpur, Malaysia 29 Nov-1 Dec (2010e).
18. Ali, J., Amiri, I.S., Afroozeh, A., Kouhnavard, M., Jalil, M., Yupapin, P.: Simultaneous dark and bright soliton trapping using nonlinear MRR and NRR. Paper presented at the ICAMN, International Conference, Prince Hotel, Kuala Lumpur, Malaysia 29 Nov-1 Dec (2010f).
19. Ali, J., Amiri, I.S., Jalil, M., Kouhnavard, M., Afroozeh, A., Naim, I., Yupapin, P.: Narrow UV pulse generation using MRR and NRR system. Paper presented at the ICAMN, International Conference, Prince Hotel, Kuala Lumpur, Malaysia 29 Nov-1 Dec (2010g).
20. Ali, J., Amiri, I.S., Jalil, M.A., Afroozeh, A., Kouhnavard, M., Yupapin, P.: Novel system of fast and slow light generation using micro and nano ring resonators. Paper presented at the ICAMN, International Conference, Prince Hotel, Kuala Lumpur, Malaysia 29 Nov-1 Dec (2010h).
21. Ali, J., Amiri, I.S., Jalil, M.A., Afroozeh, A., Kouhnavard, M., Yupapin, P.P.: Multi-soliton generation and storage for nano optical network using nano ring resonators. Paper presented at the ICAMN, International Conference, Prince Hotel, Kuala Lumpur, Malaysia 29 Nov-1 Dec (2010i).
22. Ali, J., Amiri, I.S., Jalil, M.A., Hamdi, M., Mohamad, F.K., Ridha, N.J., Yupapin, P.P.: Proposed molecule transporter system for qubits generation. Paper presented at the Nanotech Malaysia, International Conference on Enabling Science & Technology, Malaysia 1-3 December (2010j).
23. Ali, J., Amiri, I.S., Jalil, M.A., Hamdi, M., Mohamad, F.K., Ridha, N.J., Yupapin, P.P.: Trapping spatial and temporal soliton system for entangled photon encoding. Paper presented at the Nanotech Malaysia, International Conference on Enabling Science & Technology, Kuala Lumpur, Malaysia, 1-3 December (2010k).
24. Ali, J., Amiri, I.S., Jalil, M.A., Mohamad, F.K., Yupapin, P.P.: Optical dark and bright soliton generation and amplification. Paper presented at the Nanotech Malaysia, International Conference on Enabling Science & Technology, KLCC, Kuala Lumpur, Malaysia, December (2010l).
25. Ali, J., Aziz, M., Amiri, I.S., Jalil, M., Afroozeh, A., Nawi, I., Yupapin, P.: Soliton wavelength division in MRR and NRR Systems. Paper presented at the AMN-APLOC International Conference, Wuhan, China 16-18 May (2010m).
26. Ali, J., Jalil, M., Amiri, I.S., Afroozeh, A., Kouhnavard, M., Naim, I., Yupapin, P.: Multi-wavelength narrow pulse generation using MRR. Paper presented at the ICAMN, International Conference, Prince Hotel, Kuala Lumpur, Malaysia 29 Nov-1 Dec (2010n).
27. Ali, J., Jalil, M.A., Amiri, I.S., Afroozeh, A., Kouhnavard, M., Yupapin, P.P.: Generation of tunable dynamic tweezers using dark-bright collision. Paper presented at the ICAMN, International Conference, Prince Hotel, Kuala Lumpur, Malaysia 29 Nov-1 Dec (2010o).
28. Ali, J., Jalil, M.A., Amiri, I.S., Yupapin, P.P.: Effects of MRR parameter on the bifurcation behavior. Paper presented at the Nanotech Malaysia, International Conference on Enabling Science & Technology KLCC, Kuala Lumpur, Malaysia 1-3 December (2010p).
29. Ali, J., Jalil, M.A., Amiri, I.S., Yupapin, P.P.: Fast and slow lights via an add/drop device. Paper presented at the ICEM, Legend Hotel, Kuala Lumpur, Malaysia, 29 Nov-1 Dec (2010q).
30. Ali, J., Jalil, M.A., Amiri, I.S., Yupapin, P.P.: MRR quantum dense coding. Paper presented at the Nanotech Malaysia, International Conference on Enabling Science & Technology, KLCC, Kuala Lumpur, Malaysia 1-3 December (2010r).
31. Ali, J., Kouhnavard, M., Afroozeh, A., Amiri, I.S., Jalil, M.A., Yupapin, P.P.: Optical bistability in a FORR. Paper presented at the ICEM, Legend Hotel, Kuala Lumpur, Malaysia, 29 Nov-1 Dec (2010s).
32. Ali, J., Kouhnavard, M., Amiri, I.S., Afroozeh, A., Jalil, M.A., Naim, I., Yupapin, P.P.: Localization of soliton pulse using nano-waveguide. Paper presented at the ICAMN, International Conference, Prince Hotel, Kuala Lumpur, Malaysia, 29 Nov-1 Dec (2010t).

33. Ali, J., Kouhnavard, M., Amiri, I.S., Jalil, M.A., Afroozeh, A., Yupapin , P.P.: Security confirmation using temporal dark and bright soliton via nonlinear system. Paper presented at the ICAMN, International Conference, Prince Hotel, Kuala Lumpur, Malaysia 29 Nov-1 Dec (2010u).
34. Ali, J., Kouhnavard, M., Jalil, M.A., Amiri, I.S.: Quantum signal processing via an optical potential well. Paper presented at the Nanotech Malaysia, International Conference on Enabling Science & Technology, Kuala Lumpur, Malaysia 1-3 December (2010v).
35. Ali, J., Kulsirirat, K., Techithdeera, W., Jalil, M.A., Amiri, I.S., Naim, I., Yupapin, P.P.: Temporal dark soliton behavior within multi-ring resonators. Paper presented at the Nanotech Malaysia, International Conference on Enabling Science & Technology, Malaysia 1-3 December (2010w).
36. Ali, J., Mohamad, A., Nawi, I., Amiri, I.S., Jalil, M., Afroozeh, A., Yupapin, P.: Stopping a dark soliton pulse within an NNRR. Paper presented at the AMN-APLOC International Conference, Wuhan, China 16-18 May (2010x).
37. Ali, J., Nur, H., Lee, S., Afroozeh, A., Amiri, I.S., Jalil, M., Mohamad, A., Yupapin, P.: Short and millimeter optical soliton generation using dark and bright soliton. Paper presented at the AMN-APLOC International Conference, Wuhan, China, 16-18 May (2010y).
38. Ali, J., Raman, K., Kouhnavard, M., Amiri, I.S., Jalil, M.A., Afroozeh, A., Yupapin, P.P.: Dark soliton array for communication security. Paper presented at the AMN-APLOC International Conference, Wuhan, China, 16-18 May (2011).
39. Ali, J., Roslan, M., Jalil, M., Amiri, I.S., Afroozeh, A., Nawi, I., Yupapin, P.: DWDM enhancement in micro and nano waveguide. Paper presented at the AMN-APLOC International Conference, Wuhan, China, 16-18 May 2011 (2010z).
40. Ali, J., Saktioto, S., Hamdi, M., Amiri, I.S.: Dynamic silicon dioxide fiber coupling polarized by voltage breakdown. Paper presented at the Nanotech Malaysia, International Conference on Enabling Science & Technology, KLCC, Kuala Lumpur, Malaysia, (2010{).
41. Ali Shahidinejad, Iraj Sadegh Amiri, Toni Anwar, Enhancement of Indoor WDM-Based Optical Wireless Communication Using Microring Resonator. Reviews in Theoretical Science 2014. Accepted.
42. Amiri, I.S., Afroozeh, A., Ali, J., Yupapin, P.P., Generation Of Quantum Codes Using Up And Down Link Optical Solition. Jurnal Teknologi (Sciences and Engineering) 2012a; 55: 97-106.
43. Amiri, I.S., Afroozeh, A., Bahadoran, M., Simulation and Analysis of Multisoliton Generation Using a PANDA Ring Resonator System. Chinese Physics Letters 2011a; 28: 104205.
44. Amiri, I.S., Afroozeh, A., Bahadoran, M., Ali, J., Yupapin, P.P.: Up and Down Link of Soliton for Network Communication. Paper presented at the National Science Postgraduate Conference, NSPC, Universiti Teknologi Malaysia, 15-17 November (2011b).
45. Amiri, I.S., Afroozeh, A., Bahadoran, M., Ali, J., Yupapin, P.P., Molecular Transporter System for Qubits Generation. Jurnal Teknologi (Sciences and Engineering) 2012b; 55: 155-165.
46. Amiri, I.S., Afroozeh, A., Nawi, I.N., Jalil, M.A., Mohamad, A., Ali, J., Yupapin, P.P., Dark Soliton Array for communication security. Procedia Engineering 2011c; 8: 417-422.
47. Amiri, I.S., Ahsan, R., Shahidinejad, A., Ali, J., Yupapin, P.P., Characterisation of bifurcation and chaos in silicon microring resonator. IET Communications 2012c; 6(16): 2671-2675.
48. Amiri, I.S., Ali, J.: Generation of Nano Optical Tweezers Using an Add/drop Interferometer System. Paper presented at the 2nd Postgraduate Student Conference (PGSC), Singapore, 16-17 Dec (2012).
49. Amiri, I.S., Ali, J., Data Signal Processing Via a Manchester Coding-Decoding Method Using Chaotic Signals Generated by a PANDA Ring Resonator. Chinese Optics Letters 2013a; 11(4): 041901(041904).
50. Amiri, I.S., Ali, J., Nano Optical Tweezers Generation Used for Heat Surgery of a Human Tissue Cancer Cells Using Add/Drop Interferometer System. Quantum Matter 2013b; 2(6): 489-493.
51. Amiri, I.S., Ali, J., Optical Buffer Application Used for Tissue Surgery Using Direct Interaction of Nano Optical Tweezers with Nano Cells. Quantum Matter 2013c; 2(6): 484-488.
52. Amiri, I.S., Ali, J., Single and Multi Optical Soliton Light Trapping and Switching Using Microring Resonator. Quantum Matter 2013d; 2(2): 116-121.
53. Amiri, I.S., Ali, J., Characterization of Optical Bistability In a Fiber Optic Ring Resonator. Quantum Matter 2014a; 3(1): 47-51.
54. Amiri, I.S., Ali, J., Deform of Biological Human Tissue Using Inserted Force Applied by Optical Tweezers Generated By PANDA Ring Resonator. Quantum Matter 2014b; 3(1): 24-28.
55. Amiri, I.S., Ali, J., Picosecond Soliton pulse Generation Using a PANDA System for Solar Cells Fabrication. Journal of Computational and Theoretical Nanoscience (CTN) 2014c; 11(3): 1-9.
56. Amiri, I.S., Ali, J., Yupapin, P.P., Enhancement of FSR and Finesse Using Add/Drop Filter and PANDA Ring Resonator Systems. International Journal of Modern Physics B 2012d; 26(04): 1250034.
57. Amiri, I.S., Ali, J., Yupapin, P.P., Controlling Nonlinear Behavior of a SMRR for Network System Engineering. International Journal of Engineering Research and Technology (IJERT) 2013a; 2(2).
58. Amiri, I.S., Babakhani, S., Vahedi, G., Ali, J., Yupapin, P., Dark-Bright Solitons Conversion System for Secured and Long Distance Optical Communication. IOSR Journal of Applied Physics (IOSR-JAP) 2012e; 2(1): 43-48.
59. Amiri, I.S., Gifany, D., Ali, J., Entangled Photon Encoding Using Trapping of Picoseconds Soliton pulse. IOSR Journal of Applied Physics (IOSR-JAP) 2013b; 3(1): 25-31.
60. Amiri, I.S., Gifany, D., Ali, J., Long Distance Communication Using Localized Optical Soliton Via Entangled Photon. IOSR Journal of Applied Physics (IOSR-JAP) 2013c; 3(1): 32-39.
61. Amiri, I.S., Gifany, D., Ali, J., Ultra-short Multi Soliton Generation for Application in Long Distance Communication. Journal of Basic and Applied Scientific Research (JBASR) 2013d; 3(3): 442-451.
62. Amiri, I.S., Jalil, M.A., Afroozeh, A., Kouhnavard , M., Ali, J., Yupapin, P.P.: Controlling Center Wavelength and Free Spectrum Range by MRR Radii. In: Faculty of Science Postgraduate Conference (FSPGC), Universiti Teknologi Malaysia, 5-7 OCTOBER 2010a.
63. Amiri, I.S., Jalil, M.A., Mohamad, F.K., Ridha, N.J., Ali, J., Yupapin, P.P.: Storage of Atom/Molecules/Photon using Optical Potential Wells. Paper presented at the International Conference on Experimental Mechanics (ICEM), Kuala Lumpur, Malaysia, 29 November-1 December (2010b).
64. Amiri, I.S., Jalil, M.A., Mohamad, F.K., Ridha, N.J., Ali, J., Yupapin, P.P.: Storage of Optical Soliton Wavelengths Using NMRR. Paper presented at the International Conference on Experimental Mechanics (ICEM), Kuala Lumpur, Malaysia, 29 November-1 December (2010c).
65. Amiri, I.S., Khanmirzaei, M.H., Kouhnavard, M., Yupapin, P.P., Ali, J.: Quantum Entanglement using Multi Dark

Soliton Correlation for Multivariable Quantum Router. In: Moran, A.M. (ed.) Quantum Entanglement pp. 111-122. Nova Science Publisher, New York (2012f).
66. Amiri, I.S., Nikmaram, M., Shahidinejad, A., Ali, J., Cryptography Scheme of an Optical Switching System Using Pico/Femto Second Soliton Pulse. International Journal of Advances in Engineering & Technology (IJAET) 2012g; 5(1): 176-184.
67. Amiri, I.S., Nikoukar, A., Ali, J.: Quantum Information Generation Using Optical Potential Well. Paper presented at the Network Technologies & Communications (NTC) Conference, Singapore, (2010-2011).
68. Amiri, I.S., Nikoukar, A., Ali, J., New System of chaotic signal generation based on coupling coefficients applied to an Add/Drop System. International Journal of Advances in Engineering & Technology (IJAET) 2013e; 6(1): 78-87.
69. Amiri, I.S., Nikoukar, A., Ali, J., Nonlinear Chaotic Signals Generation and Transmission Within an Optical Fiber Communication Link. IOSR Journal of Applied Physics (IOSR-JAP) 2013f; 3(1): 52-57.
70. Amiri, I.S., Nikoukar, A., Ali, J., Yupapin, P.P., Ultra-Short of Pico and Femtosecond Soliton Laser Pulse Using Microring Resonator for Cancer Cells Treatment. Quantum Matter 2012h; 1(2): 159-165.
71. Amiri, I.S., Nikoukar, A., Shahidinejad, A., Ali, J., Yupapin, P.: Generation of discrete frequency and wavelength for secured computer networks system using integrated ring resonators. In: Computer and Communication Engineering (ICCCE) Conference, Malaysia 2012i, pp. 775-778. IEEE Explore.
72. Amiri, I.S., Nikoukar, A., Shahidinejad, A., Ranjbar, M., Ali, J., Yupapin, P.P., Generation of Quantum Photon Information Using Extremely Narrow Optical Tweezers for Computer Network Communication. GSTF Journal on Computing (joc) 2012j; 2(1): 140.
73. Amiri, I.S., Nikoukar, A., Vahedi, G., Shojaei, A., Ali, J., Yupapin, P., Frequency-Wavelength Trapping by Integrated Ring Resonators For Secured Network and Communication Systems. International Journal of Engineering Research and Technology (IJERT) 2012k; 1(5).
74. Amiri, I.S., Raman, K., Afroozeh, A., Jalil, M.A., Nawi, I.N., Ali, J., Yupapin, P.P., Generation of DSA for security application. Procedia Engineering 2011d; 8: 360-365.
75. Amiri, I.S., Ranjbar, M., Nikoukar, A., Shahidinejad, A., Ali, J., Yupapin, P.: Multi optical Soliton generated by PANDA ring resonator for secure network communication. In: Computer and Communication Engineering (ICCCE) Conference, Malaysia 2012l, pp. 760-764. IEEE Explore.
76. Amiri, I.S., Shahidinejad, A., Nikoukar, A., Ali, J., Yupapin, P., A Study oF Dynamic Optical Tweezers Generation For Communication Networks. International Journal of Advances in Engineering & Technology (IJAET) 2012m; 4(2): 38-45.
77. Amiri, I.S., Shahidinejad, A., Nikoukar, A., Ranjbar, M., Ali, J., Yupapin, P.P., Digital Binary Codes Transmission via TDMA Networks Communication System Using Dark and Bright Optical Soliton. GSTF Journal on Computing (joc) 2012n; 2(1): 12.
78. Amiri, I.S., Vahedi, G., Nikoukar, A., Shojaei, A., Ali, J., Yupapin, P., Decimal Convertor Application for Optical Wireless Communication by Generating of Dark and Bright Signals of soliton. International Journal of Engineering Research and Technology (IJERT) 2012o; 1(5).
79. Amiri, I.S., Vahedi, G., Shojaei, A., Nikoukar, A., Ali, J., Yupapin, P.P., Secured Transportation of Quantum Codes Using Integrated PANDA-Add/drop and TDMA Systems. International Journal of Engineering Research and Technology (IJERT) 2012p; 1(5).
80. Bahadoran, M., Amiri, I.S., Afroozeh, A., Ali, J., Yupapin, P.P.: Analytical Vernier Effect for Silicon Panda Ring Resonator. Paper presented at the National Science Postgraduate Conference, NSPC Universiti Teknologi Malaysia, 15-17 November (2011).
81. Gifany, D., Amiri, I.S., Ranjbar, M., Ali, J., LOGIC CODES GENERATION AND TRANSMISSION USING AN ENCODING-DECODING SYSTEM. International Journal of Advances in Engineering & Technology (IJAET) 2013; 5(2): 37-45.
82. I. S. Amiri, A. Shahidinejad, J. Ali, Generating of 57-61 GHz Frequency Band Using a Panda Ring Resonator Quantum Matter 2014. Accepted.
83. I. S. Amiri, Ali, J., Nano Particle Trapping By Ultra-short tweezer and wells Using MRR Interferometer System for Spectroscopy Application. Nanoscience and Nanotechnology Letters 2013; 5(8): 850-856.
84. I. S. Amiri, B. Barati, P. Sanati, A. Hosseinnia, HR Mansouri Khosravi, S. Pourmehdi, A. Emami, J. Ali, Optical Stretcher of Biological Cells Using Sub-Nanometer Optical Tweezers Generated by an Add/Drop MRR System. Nanoscience and Nanotechnology Letters 2013a. Accepted.
85. I. S. Amiri, J. Ali, Multiplex and De-multiplex of Generated Multi Optical Soliton By MRRs Using Fiber Optics Transmission Link. Quantum Matter 2014. Accepted.
86. I. S. Amiri, J. Ali, Femtosecond Optical Quantum Memory generation Using Optical Bright Soliton. Journal of Computational and Theoretical Nanoscience (CTN) 2014a. Accepted.
87. I. S. Amiri, J. Ali, Generating Highly Dark–Bright Solitons by Gaussian Beam Propagation in a PANDA Ring Resonator. Journal of Computational and Theoretical Nanoscience (CTN) 2014b. Accepted.
88. I. S. Amiri, J. Ali, Optical Quantum Generation and Transmission of 57-61 GHz Frequency Band Using an Optical Fiber Optics Journal of Computational and Theoretical Nanoscience (CTN) 2014c. Accepted.
89. I. S. Amiri, J. Ali, Simulation of the Single Ring Resonator Based on the Z-transform Method Theory. Quantum Matter 2014d. Accepted.
90. I. S. Amiri, M. Ebrahimi, A. H. Yazdavar, A. Nikoukar, J. Ali, S. E. Alavi, Sevia M. Idrus, Transmission of Data with OFDM Technique for Communication Networks Using GHz Frequency Band Soliton Carrier. IET Communications 2013b. Accepted.
91. I. S. Amiri, P. Naraei, J. Ali, Review and Theory of Optical Soliton Generation Used to Improve the Security and High Capacity of MRR and NRR Passive Systems. Journal of Computational and Theoretical Nanoscience (CTN) 2014. Accepted.
92. I. S. Amiri, S. E. Alavi, J. Ali, High Capacity Soliton Transmission for Indoor and Outdoor Communications Using Integrated Ring Resonators. International Journal of Communication Systems 2013c.
93. I. S. Amiri, S. E. Alavi, Sevia M. Idrus, A. Nikoukar, J. Ali, IEEE 802.15.3c WPAN Standard Using Millimeter Optical Soliton Pulse Generated By a Panda Ring Resonator. IEEE Photonics Journal 2013d; 5(5): 7901912.
94. I. S. Amiri, S. Ghorbani, P. Naraei, J. Ali, Chaotic Carrier Signal Generation and Quantum Transmission Along Fiber Optics Communication Using Integrated Ring Resonators. Quantum Matter 2014. Accepted.
95. I. S. Amiri, S. Soltanmohammadi, A. Shahidinejad, j. Ali, Optical Quantum Transmitter of 30 Finesse at 800 nm Central Wavelength Using Ring Resonators. Optical and Quantum Electronics 2013e; 45(10): 1095-1105.
96. Imran, M., Rahman, R.A., Amiri, I.S.: Fabrication of Diffractive Optical Element using Direct Writing CO2 Laser Irradiation. In: Faculty of Science Postgraduate Conference (FSPGC), Universiti Teknologi Malaysia, 5-7 October 2010

97. Jalil, M.A., Amiri, I.S., Kouhnavard, M., Afroozeh, A., Ali, J., Yupapin, P.P.: Finesse Improvements of Light Pulses within MRR System. In: Faculty of Science Postgraduate Conference (FSPGC), Universiti Teknologi Malaysia, 5-7 October 2010.
98. Jalil, M.A., Amiri, I.S., Teeka, C., Ali, J., Yupapin, P.P., All-optical Logic XOR/XNOR Gate Operation using Microring and Nanoring Resonators. Global Journal of Physics Express 2011; 1(1): 15-22.
99. Kouhnavard, M., Afroozeh, A., Amiri, I.S., Jalil, M.A., Ali, J., Yupapin, P.P.: New system of Chaotic Signal Generation Using MRR. Paper presented at the International Conference on Experimental Mechanics (ICEM), Kuala Lumpur, Malaysia, 29 November-1 December (2010a).
100. Kouhnavard, M., Afroozeh, A., Jalil, M.A., Amiri, I.S., Ali, J., Yupapin, P.P.: Soliton Signals and the Effect of Coupling Coefficient in MRR Systems. In: Faculty of Science Postgraduate Conference (FSPGC), Universiti Teknologi Malaysia, 5-7 October 2010b.
101. Kouhnavard, M., Amiri, I.S., Jalil, M., Afroozeh, A., Ali, J., Yupapin, P.P., QKD via a quantum wavelength router using spatial soliton. AIP Conference Proceedings 2010c; 1347: 210-216.
102. Mohamad, F.K., Ridha, N.J., Amiri, I.S., Saktioto, J.A., Yupapin, P.P.: Effect of Center Wavelength on MRR Performance. Paper presented at the International Conference on Experimental Mechanics (ICEM), Kuala Lumpur, Malaysia, 29 November-1 December (2010a).
103. Mohamad, F.K., Ridha, N.J., Amiri, I.S., Saktioto, J.A., Yupapin, P.P.: Finesse Improvements of Light Pulses within MRR System. Paper presented at the International Conference on Experimental Mechanics (ICEM), Kuala Lumpur, Malaysia, 29 November-1 December (2010b).
104. Nikoukar, A., Amiri, I.S., Ali, J.: Secured Binary Codes Generation for Computer Network Communication. Paper presented at the Network Technologies & Communications (NTC) Conference, Singapore, (2010-2011).
105. Nikoukar, A., Amiri, I.S., Ali, J., Generation of Nanometer Optical Tweezers Used for Optical Communication Networks. International Journal of Innovative Research in Computer and Communication Engineering 2013; 1(1).
106. Nikoukar, A., Amiri, I.S., Shahidinejad, A., Shojaei, A., Ali, J., Yupapin, P.: MRR quantum dense coding for optical wireless communication system using decimal convertor. In: Computer and Communication Engineering (ICCCE) Conference, Malaysia 2012, pp. 770-774. IEEE Explore.
107. Ridha, N.J., Mohamad, F.K., Amiri, I.S., Saktioto, Ali, J., Yupapin, P.P.: Controlling Center Wavelength and Free Spectrum Range by MRR Radii. Paper presented at the International Conference on Experimental Mechanics (ICEM), Kuala Lumpur, Malaysia, 29 November-1 December (2010a).
108. Ridha, N.J., Mohamad, F.K., Amiri, I.S., Saktioto, Ali, J., Yupapin, P.P.: Soliton Signals and The Effect of Coupling Coefficient in MRR Systems. Paper presented at the International Conference on Experimental Mechanics (ICEM), Kuala Lumpur, Malaysia, 29 November-1 December (2010b).
109. S. E. Alavi, I. S. Amiri, S. M. Idrus, ASM. Supa'at, J. Ali, Chaotic Signal Generation and Trapping Using an Optical Transmission Link. Life Science Journal 2013; 10(9s): 186-192.
110. Sadegh Amiri, I., Nikmaram, M., Shahidinejad, A., Ali, J., Generation of potential wells used for quantum codes transmission via a TDMA network communication system. Security and Communication Networks 2013.
111. Saktioto, S., Ali, J., Hamdi, M., Amiri, I.S.: Calculation and prediction of blood plasma glucose concentration. Paper presented at the ICAMN, International Conference, Prince Hotel, Kuala Lumpur, Malaysia 29 Nov-1 Dec 2010 (2010a).
112. Saktioto, S., Daud, S., Ali, J., Jalil, M.A., Amiri, I.S., Yupapin, P.P.: FBG simulation and experimental temperature measurement. Paper presented at the ICEM, Legend Hotel, Kuala Lumpur, Malaysia, 29 Nov-1 Dec (2010b).
113. Saktioto, S., Daud, S., Jalil, M.A., Amiri, I.S., Yupapin, P.P.: FBG sensing system for outdoor temperature measurement. Paper presented at the ICEM, Legend Hotel, Kuala Lumpur, Malaysia, 29 Nov-1 Dec (2010c).
114. Saktioto, S., Hamdi, M., Amiri, I.S., Ali, J.: Transition of diatomic molecular oscillator process in THz region. Paper presented at the International Conference on Experimental Mechanics (ICEM), Legend Hotel, Kuala Lumpur, Malaysia, 29 Nov-1 Dec (2010d).
115. Shahidinejad, A., Nikoukar, A., Amiri, I.S., Ranjbar, M., Shojaei, A., Ali, J., Yupapin, P.: Network system engineering by controlling the chaotic signals using silicon micro ring resonator. In: Computer and Communication Engineering (ICCCE) Conference, Malaysia 2012, pp. 765-769. IEEE Explore.
116. Shojaei, A.A., Amiri, I.S.: DSA for Secured Optical Communication. Paper presented at the International Conference for Nanomaterials Synthesis and Characterization (INSC), Kuala Lumpur, Malaysia, 4 –5th July (2011a).
117. Shojaei, A.A., Amiri, I.S.: Soliton for Radio wave generation. Paper presented at the International Conference for Nanomaterials Synthesis and Characterization (INSC), Kuala Lumpur, Malaysia, 4–5th July (2011b).
118. Suwanpayak, N., Songmuang, S., Jalil, M.A., Amiri, I.S., Naim, I., Ali, J., Yupapin, P.P., Tunable and storage potential wells using microring resonator system for bio-cell trapping and delivery. AIP Conference Proceedings 2010; 1341: 289-291.
119. Tanaram, C., Teeka, C., Jomtarak, R., Yupapin, P.P., Jalil, M.A., Amiri, I.S., Ali, J., ASK-to-PSK generation based on nonlinear microring resonators coupled to one MZI arm. Procedia Engineering 2011; 8: 432-435.
120. Teeka, C., Songmuang, S., Jomtarak, R., Yupapin, P., Jalil, M., Amiri, I.S., Ali, J., ASK-to-PSK Generation based on Nonlinear Microring Resonators Coupled to One MZI Arm. AIP Conference Proceedings 2011; 1341(1): 221-223.
121. Yupapin, P.P., Jalil, M.A., Amiri, I.S., Naim, I., Ali, J., New Communication Bands Generated by Using a Soliton Pulse within a Resonator System. Circuits and Systems 2010; 1(2): 71-75.

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