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A Brief Review on Frequency Encoding

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Abstract – In case of super-fast optical computation and communication, frequency encoding techniques are found to be very promising and reliable one. Optical logic gates based on the principle of frequency conversion of some non-linear materials play the key role for the implementation of a frequency encoded data processing system. Again semiconductor optical amplifier has already been established successfully for frequency conversion. In frequency encoding system, different frequencies of light signal are used for representation of binary bits 0 or 1 instead of intensity variation. For example 0 and 1 bits of Boolean logic can be coded by two different frequencies of light signa and respectively. In this communication, we propose the method of developing an optical memory or a NOT based latch. Several types of phase encoded, polarization encoded and intensity encoded optical memories have been reported earlier, including latch also, whereas this proposal have been planned to develop an all optical latch logic using frequency encoded principle and it offers a reliable and faithful processing rather than other established techniques.

Keywords – Optical Computation, Non-Linear Materials, Semiconductor Optical Amplifier.

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INTRODUCTION

As an elective innovation, optical flag preparing has turned out to be imperative in data handling, calculation, information dealing with, picture preparing, tending to, multiplexing, demulti-plexing, recovery and exchanging not just on account of speed constraint of electronic innovation yet in addition for its characteristic paral-lelism. Numerous plans have been proposed to acknowledge different computerized flag handling in most recent couple of years in the optical area .In a parcel changed system to guarantee that a bundle is effectively sent through the system, switches are utilized to for perform-ing a large group of preparing capacities on every parcel's header. A few larger amount handling modules, equality checker have been shown for performing header acknowledgment kind of musical drama tions in this specific situation. Optical half viper and full snake can be utilized to actualize optical checksum computation and parallel counter sort of directing capacities to guarantee information respectability. Optical half subtractor discovers applications in encryption and decoding of cryptographic information and double heading twofold counters. Different structures of optical half viper , half subtractor have been proposed. They are essentially utilizing two semiconductor optical enhancers (SOAs) in a circle reflect (SLALOMs) one goes about as AND entryway and different as a X-OR door, utilizing three land hertz optical hilter kilter demul-tiplexer (TOADs) one going about as AND entryway and other two as X-OR door, utilizing four SOAs , utilizing occasionally poled

REVIEW OF LITERATURE

OFDM Survey

Reception apparatuses are imperative components of remote informa-tion transmission technologies In radio designing, recieving wires allude to gadgets changing over electric and attractive flows to radio waves and, the other way around, radio waves to flows . In the most recent decade, the meaning of radio wires was broadened and the idea of plasmonic nanoantennwas presented on account of the rise of another part of science known as nano-optics, which ponders the transmission and gathering of optical signs at the nano-scale (Maiman, 1960, Kao and Hockham, 1966). Plasmatic nanoantennas are made of uniquely planned metal (generally gold or silver) nanoparticles and their plan outwardly takes after the ex-isting structures of RF reception apparatuses (Bell, 2010). Like RF a tennas, plasmonic nanoantennas discharge, get and, all the more for the most part, control light with nano-scale (sub wavelength) components, whose estimate is a lot littler than the wavelength of occurrence light.

Be that as it may, the working standards of plasmonic nanoantennas and RF reception apparatuses are different. The re-sponse of nanoantennas to episode light is managed by aggregate electron motions – plasmons Plasmon's make it conceivable to control light with subwavelength structures, which isn't promptly conceivable with RF a tennas whose measurements are similar with the wave-length of

radio waves. Also, nanoantennas not just control light like radio wave however they additionally locally upgrade optical power by numerous requests of siz. This effect is reachable in view of a solid nearby field repression close to the metal surface of the nanoantenna, and it is utilized to upgrade the incredibly little nonlinear optical reaction of nanoscale materials up to the dimension feasible with perceptible nonlinear gems and optical strands.

(an) Illustration of emanation (left) and gathering (ideal) of radio waves by a dipole RF recieving wire. (b) Illustration of discharge (left) and gathering (ideal) of light by a dipole plas-monic nanoantenna. In all Panels, λ indicates the wavelength of the episode radio waves or light in free space. The twofold headed bolts show the elements of the radio wires in comparison with λ. (c) Optical properties of magneto-plasmonic nanoantennas are like those of non-attractive nanoan-tenas. In any case, the utilization of attractive constituent materials and outside attractive fields includes new degrees of opportunity in the control of light at the nano-scale, which permits creating novel gadgets with one of a kind properties (see the primary content).

Dierent parts of plasmonic nanoantennas were discussed in detail in However, the exploration bearing of plasmonic nanoantennas is extremely wide and quickly growing as a result of the need to grow promotion moved optical nanomaterials with already unattain-capable usefulness, higher execution, littler impression

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In any case, the working standards of plasmonic nanoantennas and RF reception apparatuses are different. The re-sponge of nanoantennas to occurrence light is directed by aggregate electron motions – plasmas. Plasmon's make it conceivable to control light with subwavelength structures, which isn't promptly conceivable with RF a tennas whose measurements are practically identical with the wave-length of radio waves. In addition, nanoantennas not just control light like radio waves however they additionally locally improve optical power by numerous requests of greatness This effect is feasible due to a solid neighborhood field repression close to the metal surface of the nanoantenna, and it is utilized to improve the incredibly little nonlinear optical reaction of nanoscale materials up to the dimension reachable with perceptible nonlinear precious stones and optical filaments.

(an) Illustration of discharge (left) and gathering (ideal) of radio waves by a dipole RF recieving wire. (b) Illustration of outflow (left) and gathering (appropriate) of light by a dipole plas-monic nanoantenna. In all Panels, λ means the wavelength of the episode radio waves or light in free space. The twofold headed bolts show the components of the radio wires in comparison with λ. (c) Optical properties of magneto-plasmonic nanoantennas are like those of non-attractive nanoan-tenas. In any case, the utilization of attractive constituent materials and outside attractive fields includes new degrees of opportunity in the control of light at the nano-scale, which permits creating novel gadgets with one of a kind property (see the primary content).

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SEMICONDUCTOR OPTICAL AMPLIFIER BASED OPTICAL SWITCHING

Semiconductor optical speaker (SOA) is commonly founded on uniquely GaAs material. It is utilized for building up a few optoelectronic gadgets which under appropriate working condition can intensify an info flag. SOA can be ordered into two principle types; one is the Fabry Perot SOA (FP-SOA), where reflections from the end surfaces are essential the flag experiences numerous goes through the enhancer. On the opposite side in Traveling Wave (TW-SOA) the reflection is immaterial a flag experiences just a solitary goes through the enhancer. This sort of SOA can be utilized in optical straightforward systems administration. The non-linearity of SOA can likewise be utilized effectively in numerous useful applications, which are brought about via bearer thickness incited by the intensifier's info flag. There are four sorts of non-linearities in SOA, which are cross addition adjustment (XGM), cross stage tweak (XPM), self-stage balance (SPM), and four wave blending (FWM).

Here in this correspondence the creators misuse the cross increase tweak character of SOA. Changing transporter thickness of the speaker will influence the

majority of the information signals went into the SOA. Transporter lifetime relies on the transient reaction of the bearer thickness. A frail CW test light of wavelength 1 and a solid siphon light emission 2, with a little flag consonant regulation at rakish recurrence, are infused to the info terminals of the SOA. The solid siphon pillar exchange its all-out capacity to the powerless test bar and afterward the feeble test bar winds up solid and turns out to the yield terminal the SOA goes about as a wavelength converter. It exchanges data starting with one wavelength then onto the next flag at an alternate wavelength. The plan is appeared in Fig.1. There are two fundamental plans utilized in XGM based wavelength converters; where one is the co-engendering and the other is counter-spreading plans. In this correspondence we utilize the co-engendering type XGM wavelength converter. This sort of converters having hostile to reflecting covering at the front surface which gives no reflection to 1 yet backings transmission for 1 and 2 and an exceedingly reflecting surface at the yield which gives a decent

Reflection for and great transmission for 1 wavelength. In the event that 1 does not exist at one information test terminal, this transformation isn't permitted. Presently for the change procedure the jobs of the above coatings are particularly essential.

This covering fundamentally guarantees the acquiring of 1 motion at the yield. Accordingly this SOA carries on as flawless optical switch. The wavelengths of the siphon and test inputs are commonly chosen as 1555 nm and 1550 nm relating to recurrence _ and _ individually when GaAs is utilized as the concerned SOA.

Semiconductor optical enhancer (SOA) is commonly founded on extraordinarily GaAs material. It is utilized for building up a few optoelectronic gadgets which under appropriate working condition can enhance an info flag. SOA can be characterized into two primary sorts; one is the Fabry Perot SOA (FP-SOA), where reflections from the end surfaces are imperative the flag experiences numerous goes through the speaker. On the opposite side in Traveling Wave (TW-SOA) the reflection is unimportant a flag experiences just a solitary goes through the enhancer. This kind of SOA can be utilized in optical straightforward systems administration. The non-linearity of SOA can likewise be utilized effectively in numerous practical applications, which are brought about via transporter thickness actuated by the intensifier's information flag. There are four kinds of non-linearities in SOA, which are cross increase regulation (XGM), cross stage tweak (XPM), self-stage adjustment (SPM), and four wave blending (FWM).

Here in this correspondence the creators abuse the cross increase tweak character of SOA. Changing bearer thickness of the enhancer will influence the majority of the info signals went into the SOA. Bearer lifetime relies on the worldly reaction of the transporter thickness. A frail CW test light of wavelength 1 and a solid siphon light emission 2, with a little flag consonant balance at rakish recurrence , are infused to the information terminals of the SOA. The solid siphon shaft exchange its all-out capacity to the feeble test bar and after that the frail test pillar ends up solid and turns out to the yield terminal the SOA goes about as a wavelength converter . It exchanges data starting with one wavelength then onto the next flag at an alternate wavelength. The plan is appeared in Fig.1. There are two fundamental plans utilized in XGM based wavelength converters; where one is the co-spreading and the other is counter-engendering plans. In this correspondence we utilize the co-engendering type XGM wavelength converter. This sort of converters having against reflecting covering at the front surface which gives no reflection to 1 yet backings transmission for 1 and 2 and a profoundly reflecting surface at the yield which gives an extremely decent Reflection for 2 and great transmission for 1 wavelength. In the event that 1 does not exist at one info test terminal, this transformation isn't permitted. Presently for the transformation procedure the jobs of the above coatings are especially vital.

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2. Working principle

The working of the above number juggling units remains on the recurrence encoding strategy, four-wave blending, separating prop-erty of include drop multiplexer and nonlinearity in Reflective SOA.

2.1. Frequency encoding

In this encoding framework the consistent states '0' and '1' are repre-sented by two distinct frequencies 1 and 2 individually. Utilizing this procedure reality table of the half snake, half subtractor, and full viper is appeared.

2.2. Four-wave mixing (FWM)

Four-wave blending is a reasonable nonlinear procedure and can happen in SOA between two flags, a solid siphon and a more fragile test flag. There are diverse instruments behind the age of four-wave blending:

(i) Modulation of the transporter thickness, in which the carrier– opening recombination between the conduction and valence band.

(ii) Spectral opening consuming (SHB), is caused because of the formation of gap in the entomb band bearer conveyance.

(iii) Carrier warming which is brought about by the invigorated discharge and free bearer ingestion.

For proficient FWM, the polarization condition of the siphon and the test signals must be the equivalent. So some polarization con-trol instrument of either test or siphon will be fundamental. In any case, in co-energized and symmetrical captivated double siphon conspires, the FWM is polarization unfeeling. In the usage of all optical rationale doors in this correspondence symmetrical energized siphons plan to produce FWM will be utilized. In this plan the symmetrical spellbound siphons communicate with the info information sig-nal to create another conjugate flag, the intensity of which is likewise polarization free. For this two symmetrically polar-ized siphons of frequencies An and B are consolidated by a 50:50 coupler and the joined siphon flag is joined again with a low power test flag of recurrence s by a 90:10 coupler and

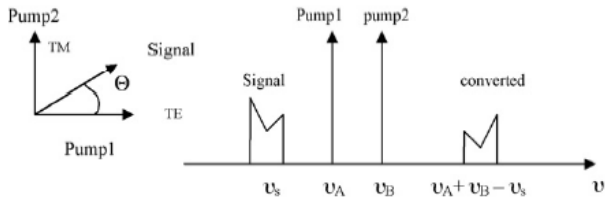

Fig. 1. FWM by orthogonal polarization scheme.

Frequency routing by add drop multiplexer (ADM)

The recurrence steering is accomplished utilizing ADM by appropriately alter ing the driving current. The capacity of ADM is to isolate a specific recurrence channel without impedance from nearby channels. This is accomplished by a recurrence demultiplexer by inte-ground tunable SOA channel as in Fig. 2.The channel can be tuned by changing infusion current. The frequency channel chose is reflected by the channel, enhanced second time by the MQW segment and extricated to drop port utilizing circulator. The rest of the recurrence channels go through the channel segment.

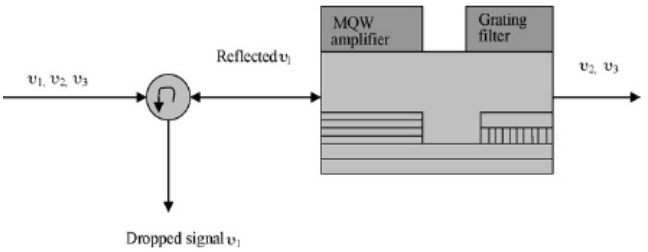

Fig. 2. Tunable SOA filter ADD/DROP multiplexer.

CONCLUSION

In the wake of having a thorough writing audit in various fields, some significant holes in writing review are completed in request to define the issues for deriving distinctive goals of present research. A while later approach is proposed and afterward proposition association is provided. Important commitments of present research work for the general public pursued by the further potential outcomes in this domain are displayed in this section.

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