

Li-Fi - A Technology ahead with light Particles

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Abstract— The range of Li-Fi is fixed approx 10 meter till now but the main research or main development is required to done in increases its length from 10 meter to more range. This range is enough for a particular class room or any other particular room. This paper mainly focus on Li-Fi range and by applying several methodology and experiments we gamut the Li-Fi its range . One method in this paper put forward is use of concave mirror which increase the range of Li-Fi and through which use Li-Fi can be used in big rooms. Most important factor and most important advantage about Li-Fi it is based on visible light communication as this range of wavelength is free available so we don't require any kind of license to purchase this or to use this. If this technology cone into entity than the data exchange become very whirlwind.

keywords- Light fidelity, wireless fidelity, spectrum

I. OVERVIEW

As the population is increase day by day so we required to increase the productivity of the wireless communication. Li-fi provide the new epoch in the wireless applied science. As the internet is accessed due to the increase of devices, the availablity of the bandwidth which is fixed makes to use high speed data transfer rates and to be connected to the secure networks. As compared to any other wireless technology Li-Fi provides much high bandwidth and more effective connectivity so more user don't face any problem in internet connectivity. This technology was first done by Heardly Hass in Edinburgh in late July 2011 stating it as "data through illumination".[3]

It works on the phenomenon of transferring the data through the LED by varying the light and its intensity which is way more turbo so that human eye can observe that light.

As visible spectrum is used in this technology, in aspect with the Wireless technology which exhibits the electro magnetic waves, Li-Fi doesn't harm our body as compared to the Wi-Fi which is hazardous for the body and could affect it in many dangerous ways.[2]

Through the communication by LEDs, Li-Fi technology has changed the way of accessing the internet, streaming videos, downloading stuffs and much more. Range of the Li-Fi could be the major issue, but the security would not be the issue as no one could access the data in the absence of light. Therefore Li-Fi uses transmitter and receiver with connected through LED lamps and used for data conveyance.

We also review a technique in this paper how to decrease the cost of Li-Fi and increase its bandwidth and more important increase its range. [8]

II. Problem regarding existing wireless technology

Due to lack of resources available in radio frequency like 1st generation, 2nd generation till 5th generation. Lack of pertinent resources in radio frequency (Rf). So the bandwidth is limit in between 300khz and 4Ghz[1].

There are so many assorted technology which give solution to this particular muddle like "cognitive radio"[2]. By using electromagnetic spectrum range this will also overcome the problem and this review paper consist of transmitter and receiver architecture.

So, we only left with visible light communication the range between [400-800] Thz it is range of visible communication for data transmission.[10]

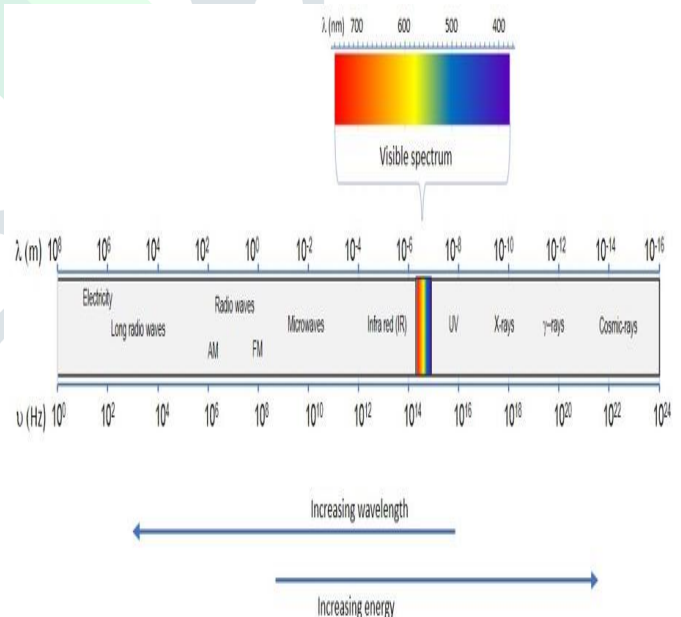


Figure1. It shows the various range of electromagnetic spectrum along with wavelength all the rays is harmful so we left only with visible light spectrum.

In paper [3] the methods of Li-Fi technology is done in this paper as we know Li-Fi has low power so in this paper it is bid if we use multiple carrier modulation technique {MCM} it will helpful to increase the power of Li-Fi also this paper mainly lineup the power.

In paper [4] we review as radio frequency is limited should we use the optical wireless communication {OWC}. IEEE spectrum and diverse data modulation technique.[11]

III. LI-FI STRENGTH AND WEAKNESS

Wireless fidelity which we are using now a days but the alternative for this technology is available in the market which is called light fidelity. Here, are some its toughness and fragility introduce in this paper.



Figure 2. LI-FI's strengths and weaknesses

Security - Li-Fi optical signals are not able to penetrate walls

Figure 2. we review the process of Li-Fi and its weakness and strengths.

Security- Its signal will not probe from the walls of the room this provide more secure as compared to any other wireless technology.

No License requires - As Light fidelity is based on VLC so it is free of cost as well as no license is required to use.

Health - It is much more safer than any other technology as it does not produce any type of radiation.

Energy - As most of the energy consume on the indoor light mostly indoor light are turn ON so if we are using this technology it will decrease energy consumption and further this energy consume to some where else.[12]

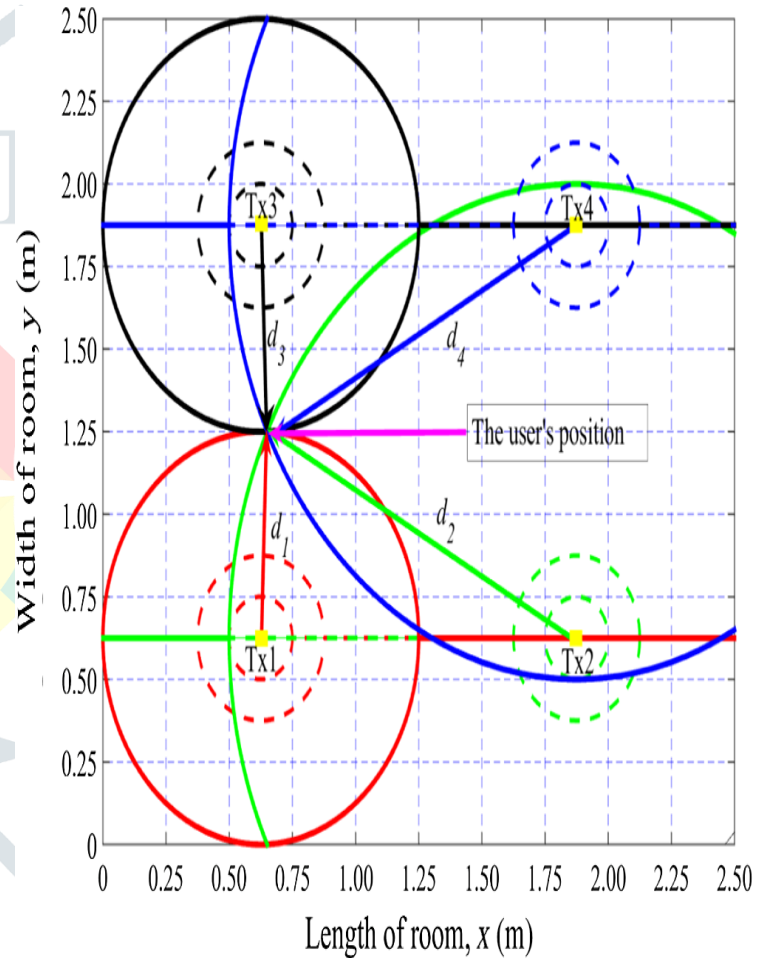


Figure 3. This shows and also we review length vs width of the room and consumption of energy through VLC.

IV. PROPOSED METHOD

As elaborated before that this review paper mainly focus to swell its gamut of Li-Fi to overcome this problem of mirror and lens is used as it give rear and front form of image. Also, in this method we increase the distance and angle of the mirror image. However, the use of LED will decrease.[13]

- Using mirror in different manner -

As a mirror has a property it will reflect back the light which passes from LED to an object so as it will give real image of an object.

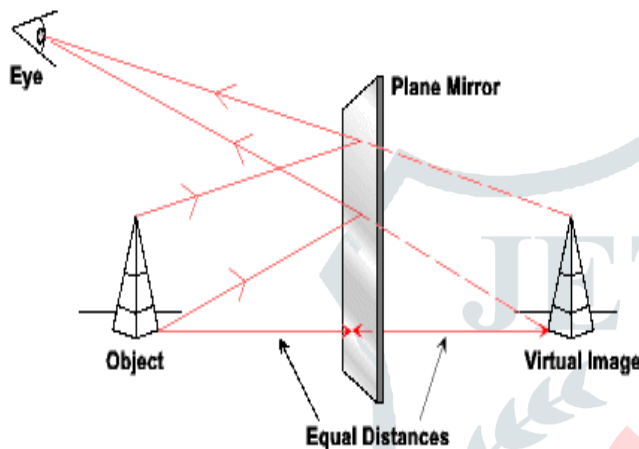


Figure 4- Reflection of mirror as it gives the image of an object after reflection called virtual image as shown in figure.

- Another method use of concave and convex mirror.

We review that convex mirror will not give real image so hence, we only left with concave mirror it give downright image, real image, more focused image.

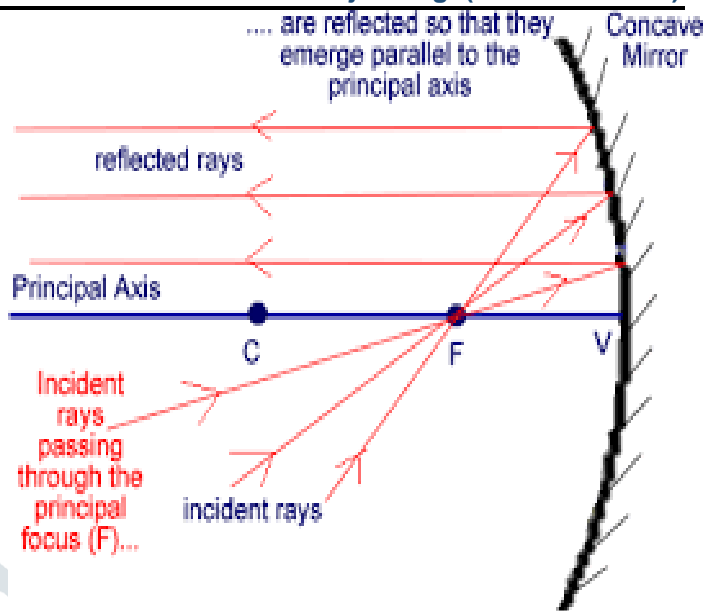


Figure 5 It shows the image of Concave mirror with the incident rays

V. CONCLUSION

We have reviewed if we combine both lens and mirror together it will give real image and the today's as well the range of Li-Fi is lean. In future this limit will be consider and also if we place more LED together the cost and speed will increase. In future this will b consider the mirror used here will give larger image size and larger view. Also if we are using Li-Fi in our pocket than it will not work this problem also should be overcome and also LIFI does not get its IEEE standard yet. The main research or the main work is required to done in its modulation technique and its weakness. This review paper mainly focus and show the problems still available regarding Li-Fi. [1]

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