

“Effects of computer & electronics devices on user’s health”

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Abstract: The purpose of this research paper is to identify the electromagnetic field generated by the electronics and computer and computer peripherals and also study the Electromagnetic effects on health of Computer Users. Human exposure to electromagnetic fields (EMF) comes from many different sources and occurs in various situations in everyday life. Man-made static fields are mainly found in occupational settings, such as close to Computers and their peripherals such as Monitor, Mouse, Key board, Printers, Scanner and other input output devices, although DC high-voltage overhead transmission lines are being constructed, which are expected to expose larger parts of the population to static electric and magnetic fields. The main objective of this paper is to study electromagnetic effects (EME) generated by CPU, Computer Motherboards, CRT Monitor, LCD, LED & TFT only. The research also studies the effect of Extremely Low Frequency (ELF) on computer user’s health as generated by the computer and computer related peripherals. Most of people would not want to sit under high voltage power lines. But they will happily sit a foot away from a computer screen, with a computer, printer and UPS on the desk next to them. And they will work like this for several hours every day, for many years, absorbing as much Extremely Low Frequency (ELF) radiation than if their desk was close to high voltage power line.

Keywords: Gauss meter, ELF, Phototronic, Electromagnetic fields, EMF, RF, IF, ELF, static fields, millimetre wave, THz, health effects.

I. INTRODUCTION

Every electric and electronic device including computer requires electricity to run till date and electricity produce electromagnetic radiation. The electric fields and magnetic field are component of the EMF can be separately measured. The electrical field strength can be measured in Volts per meter (V/m) or as power density in milliwatts per square centimeter (mW/cm). The magnetic fields can be quantified in mill gauss (mG) or micro Tesla (1 micro Tesla = 10 milligauss). This paper describes electromagnetic effects especially generated by the electronic device such as computer and related devices.

Electromagnetic radiation (EMR) is the radiant energy released by certain electromagnetic processes. The electromagnetic waves that compose electromagnetic radiation can be imagined as a self-propagating transverse oscillating wave of electric and magnetic fields. EMR wave propagating from left to right. The electric field is in a vertical plane and the magnetic field in a horizontal plane. The electric and magnetic fields in EMR waves are always in phase and at 90 degrees to each other.

II. EMF RADIATIONS BY COMPUTER & ITS EFFECTS

EMF radiation generated computer & other electronics device is a real health hazard today. Many of us spend our working days in front of computer monitors, laptop, smart phone and other electronics device, each item emitting emf radiation because of duration of exposure. This type of radiation, known as Extremely Low Frequency (ELF) is also emitted from power lines, electrical substation, TV and other electrical and electronic appliances. Another type of electromagnetic radiation found near computers is microwave radiation. When I conduct practical in computer lab of 30 P-IV computers with CRT Monitors, surrounding area shows 1800 to 2000 micro gauss emf forces, when I conduct a practical with one computer of same configuration it shows around 800 micro gauss electromagnetic forces. When I conduct a practical with LCD monitor than gauss meter shows 200 to 700 micro gauss radiation.

When I conduct a practical on user’s health on around 200 users in different institute and industry I found around 35% users suffers

| Sr. No. | Operation Time / daily | Health problems | No of user | Remarks |
|---------|------------------------|--|------------|-------------------|
| 1 | 3- 4 hours | Eye irritation, headache, irritated, Eye related problems | 45 | From 100 Students |
| 2 | 6 to 8 hours | Irritation, Loss of Concentration, Sleeplessness, indigestion , Cervical spondylosis, finger pain, | 55 | From 100 employee |

Table 1 : Working hour and health effects on the users

III. STUDIES CONDUCTED IN INFERTILITY CENTERS AND NURSING HOME

(Age group between 30-45 years old, No of Patients 100)

| Sr. No. | Industry / Fields | Number of patients | %age of patients |
|---------|----------------------------------|--------------------|------------------|
| 1 | Field worker /Labor Class | 03 | 3% |
| 2 | Defense and related field | 05 | 5% |
| 3 | Shopkeeper and Business man | 18 | 18% |
| 4 | Service / Administrative Class | 29 | 29% |
| 5 | CSE/ IT / Electronics/Electrical | 45 | 45% |

Table 1.4 Shows percentage of infertility patients of different work group

This study clear cut shows that around 74% patients are from IT and their related fields are suffering from the infertility problems. Both classes from Sr. No 4 and 5 using computer and other electronics devices in their respective working area and spends more than 8 to 12 hours daily

This study also shows that the growth of infertility centers is also increasing many folds after year 2000 and during the growth of Computer Science and mobile phones. The growth period of fertility science, computer science and mobile phone is almost same. This growth time also give clear cut indication that there is some relationship / effects of Computer or mobile radiation on users of Computer and mobile phones.

3.1 Study Conducted At Eye Care Center

(Age group below 15-25 years old, No of Patients 100)

| Sr. No. | Industry / Fields | Number of patients | %age of patients |
|---------|--------------------------------|--------------------|------------------|
| 1 | Field worker /Labor Class | 00 | 0% |
| 2 | Defense and Related field | 00 | 0% |
| 3 | Shopkeeper and Business man | 06 | 06% |
| 4 | Service / Administrative Class | 14 | 14% |
| 5 | Computer Science & IT sector | 22 | 22% |
| 6 | Students Computer Sc & IT | 34 | 34% |
| 7 | Students Humanities Group | 10 | 10% |
| 8 | Students Science Group | 14 | 14% |

Table 1.5 Shows percentage of Eyes related problems in different work group

This study conducted during the month of February & March 2016 at different eye care centers located in Ludhiana and it gives clear cut indications about the relationship between health of eyes of the computer users and EMF effects generated by the Computers. When I summarize this study in the form of above said table the point number 5 and 6 i.e about Computer Science / IT Sectors and Students of Computer Sc & IT ($11 + 17 = 28$) 28 patients from 50 patients are found from computer and related fields i.e about 56% out of the total patients. It show more than 50 % patients of eye related problems fond only in IT sector below the age group 25 years old.

IV. SOLUTIONS & CONCLUSIONS

The objective of this research paper is to identify the computer and electronic devices generated electromagnetic fields and their effects on computer user. Most of people would not want to sit under high voltage power lines. But they will happily sit a foot away from computer screen, with a computer, printer and UPS on a desk next to them. And they will work like this for several hours a day, for many years, absorbing as much Extremely Low Frequency (ELF) radiation as if their desk was close to high voltage power line.

It is suggested and recommended that if we use **photon** as a main source of transmission of signals either inside the CPU, motherboard, and any other type of data or signal transmission circuit instead of electron than we cannot even reduce the effect of EMF but also eliminate the EMF radiation problems., if we develop any technique or device who uses photon as a basic unit of transmission instead of electron than we are able to not even to reduce the EMF effects but also eliminate the emission of Electromagnetic waves from manmade electrical / electronic devices . Presently computer system uses electron / current as a transmission media of signal either inside the CPU or outside the CPU, Motherboard and other electronic device.

In future (if we develop) Photonic or phototronic materials as a transmission media than CPU and all other computer devices uses Photon as transmission media of signals either inside the CPU or outside the CPU even in display unit. Through this technique we can increase the speed of processing unit in many fold and also increase the storage capacity of the had disk drive or any other storage device can be used who can use the

photon as a basic unit of storage instead of bit or flops. If we are able to make a phototronic computer / quantum computer than we will be able to process any signal 90% faster than the present computing system because present electric computer / current flows at only 10% of the speed of the light. The speed of the transmission through the electric current very over the distance because electric current conductor having their own resistance over the current and it is very far from materials to materials

1) *Future Scope*

This section describes the issues to be investigated. I suggest the following research topics:

- Develop a device CPU who uses photon as basic unit of signal instead of electron.
- Use of light through Fiber optics instead of Electricity.
- In-depth analysis of RF signals emitted by typical computers and their peripherals, including keyboards.
- Determination of likely interception ranges for various classes of attackers.
- Development of new protective counter-measures, both hardware and software.
- Development of any type of system which would reduce the energy gap of the semiconductor used in the development of Integrated Circuits.
- Testing of existing counter-measures together with development of offensive tools (unfortunately you need a gun to test bullet-proof glazing).
- Development of free, open-source software, protocols and modulation schemes for using plain computer equipment for wireless communications.
- Propagation of compromising emanations in power and telephone lines.
- The possibility that various electronic devices might pickup and retransmit (possibly modulating) compromising emanations. Emanation techniques could even contaminate digital transmissions and be digitally relayed.
- Vulnerability and protection of equipment against active electromagnetic attacks.
- RF3P is a new, parallel, driven frequency electromagnetic solver based on the finite – element technique.
- Future Possibility of Work on Computational Geometry.

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