

## OBSERVATION OF CELL PHONE ENERGY RADIATION EFFECT

---

**E. W. Likta**

*Department of Physics*

*University of Maiduguri, Maiduguri, Borno State, Nigeria.*

*Email: emmalikta2014@gmail.com*

### ABSTRACT

The goal of this paper is to show that using cell phone, electromagnetic wave is transferred to the body which causes health problems especially at the place near ear skull region where they are known to affect the neurons. Data capture sheet was used in this field work to collect various data from the five types of phones. Tecno phone has low radiation ranging from 0.2  $\mu$ Hz to 0.02  $\mu$ Hz. So such cell phone is advice to use because of its low radiation.

**Keyword:** Android phone, Iphone, Java Phone, Black Berry Phone and Smart Phone

### INTRODUCTION

Cell phone communication is where signal is transferred via electromagnetic wave through radio frequency and microwave signals. This signal produces electromagnetic radiation in the form of thermal radiation that consists of harmful ionizing radiation and harmless non-ionizing radiation. People have welcomed the technology as indicated by the widespread use of cell phone which suggests that they do not perceive it as a potential health hazard; however concerns about the possible adverse effects on hearth as a result of the exposure to RF and microwave electromagnetic field have been expressed since the introduction of cell phone (Hardell et al., 2003).

When using cell phone, electromagnetic wave is transferred to the body which causes health problems especially at the place near ear skull region where they are known to affect the neurons (Delgado et al., 1982). The radiations interfere

with the electrical impulses that two neurons connect each other with. This can lead to deafness and migraines. People using cell phones are prone to high blood pressure and other symptoms such as hot ears, burning skin, headaches and fatigue (Aalto et al., 2006). There have been various studies into the connection between cell phones and memory loss. Because of their smaller heads, thinner skulls and higher tissue conductivity, children may absorb more energy from a given phone than adults (Binhi Vladimir et al., 2002).

## **MATERIAL AND METHOD**

The materials used are; Android phone, Iphone, Java phone, Black Berry phone, Smart phone, Trifield meter and Meter Ruler while the follow are the method.

### **Sampling Technique**

In view of the researcher's inability to reach out to the entire population ,and in order to gain the advantage of an in-depth study and effective coverage, samples are drawn using convenience sampling technique of five different phones which are ; Nokia ,Apple I phone, Tecno m3, Black Berry and Gionee p2.

Primary data collection is necessary when a researcher cannot find the data needed from secondary sources. The three basic means of obtaining primary data are observation, survey and experiment. The study adopted the primary sources of data collection by survey research design using Trifield meter and Meter Ruler

### **Sample Method**

Samples are drawn using convenience sampling technique of five different phones which are;

- I. Android phone,
- II. Iphone,
- III. Java phone,

IV. Black Berry phone and

V. Smart phone

### **Data Gathering Method**

For this study, primary data were obtained through data collection to provide the most valid information which provided authenticity and accuracy while secondary data were sourced because they afforded the researcher understanding of the subject matter. Therefore the study adopted survey research design for data collection.

### **Instrument of Data Collection**

Data capture sheet was used in this field work to collect various data from the five types of phones. Trifield meter was used to detect readings of non ionize radiation on each of the phone sample, while the meter ruler is used in measuring the distance between the trifield meter and the phone sample

### **Methods of Data Analysis**

This study uses descriptive statistics to investigate the effects of exposure to cell phones in general population. Descriptive statistics including frequencies and means for the statements are examined. Graphics were drawn for every item by using frequencies. For the phone samples

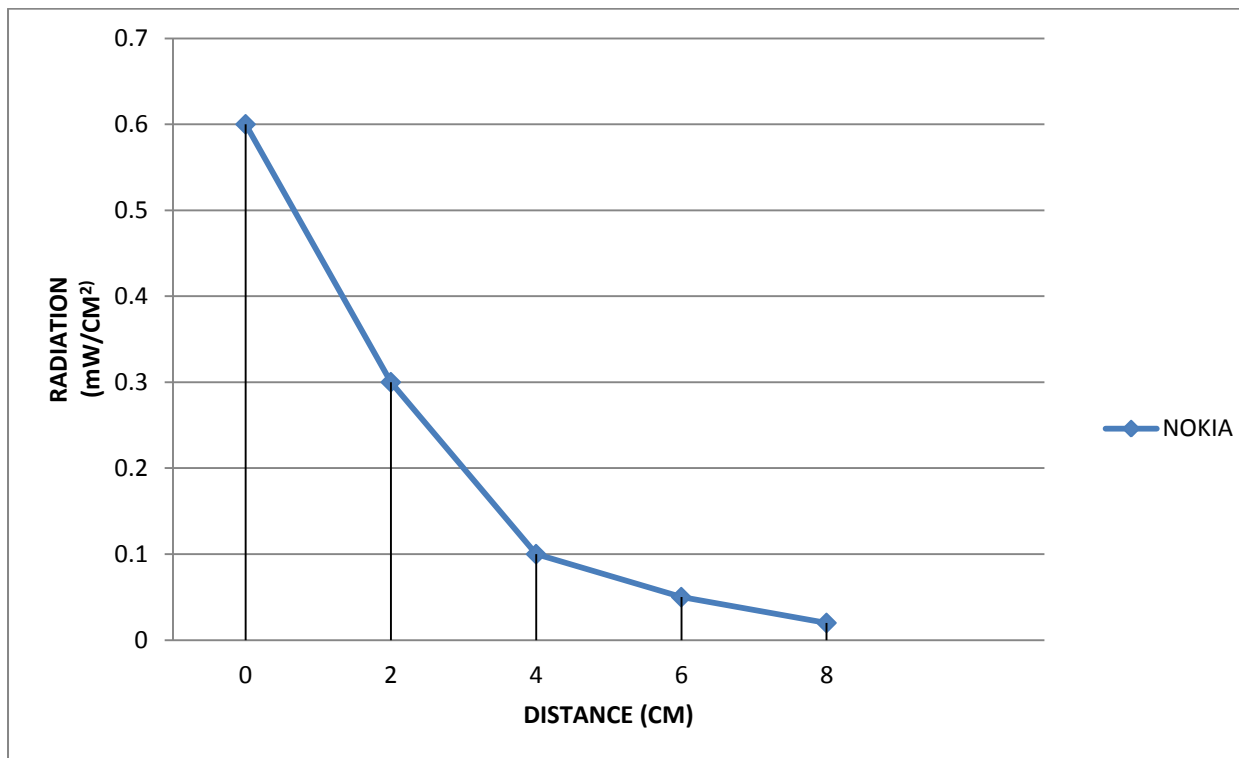
## **RESULTS**

The measured result of five different cell phones is analyzed in table 1 accordingly.

**Table 1. Radiation Level of Five Different Cell Phones**

S/n	Cell phone brand and types (mw/cm <sup>2</sup> )	0cm	2cm	4cm	6cm	8cm
1.	Nokia	0.6	0.3	0.1	0.05	0.02
2.	Apple iphone 4	1.18	1.02	0.97	0.79	0.5
3.	Tecno m3	0.2	0.07	0.05	0.03	0.02
4.	Blackberry bold 5	0.15	0.01	0.059	0.05	0.03
5.	Gionee p2	0.7	0.6	0.5	0.2	0.1

To study the effect of mobile phone radiation on human health, table 1 shows the detail of radiation base on five different phones.



**Figure 1. graph of nokia radiation level against distance in centimeter.**

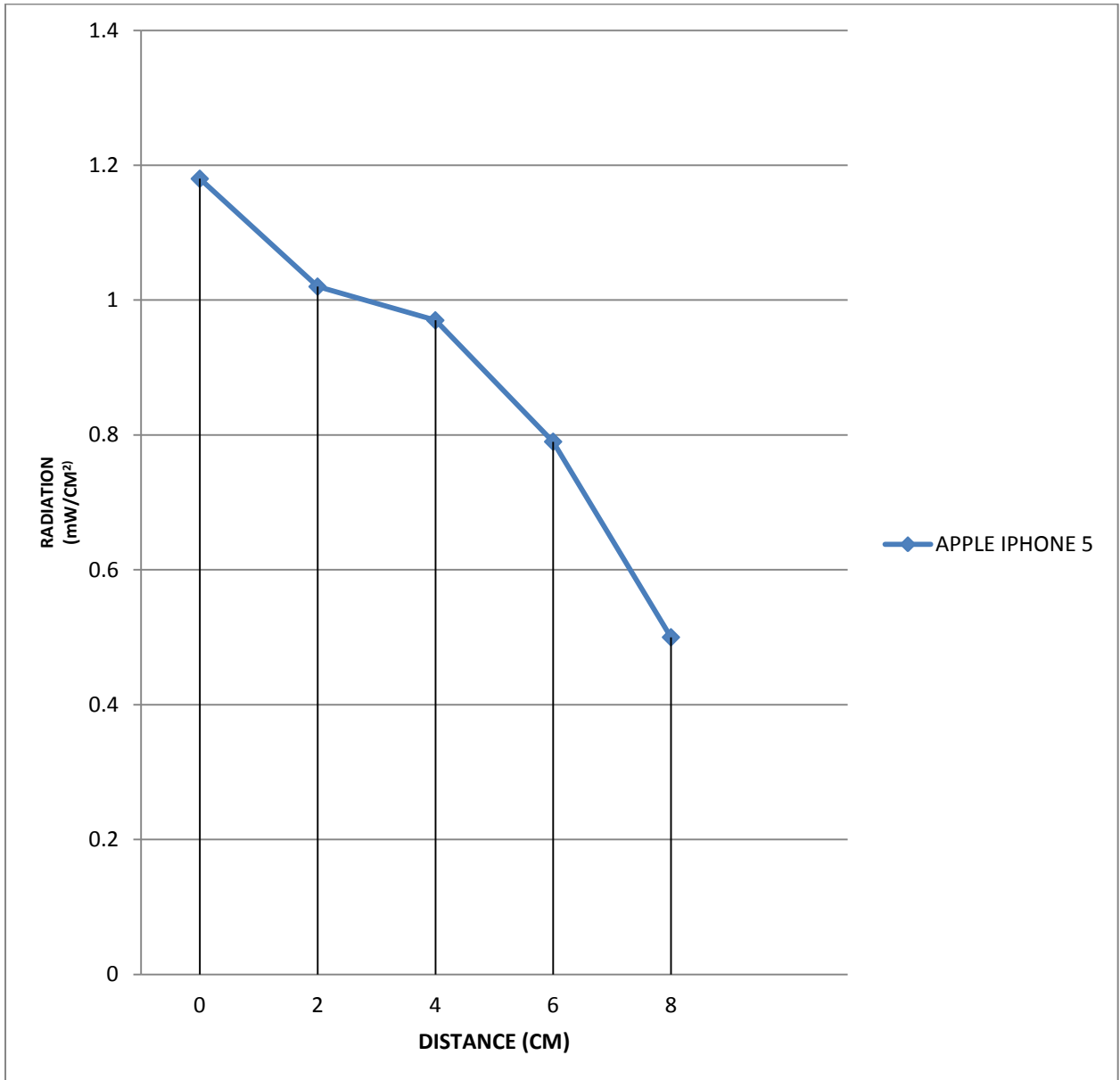


Figure 2: graph of apple iphone radiation level again distance in centimeter.

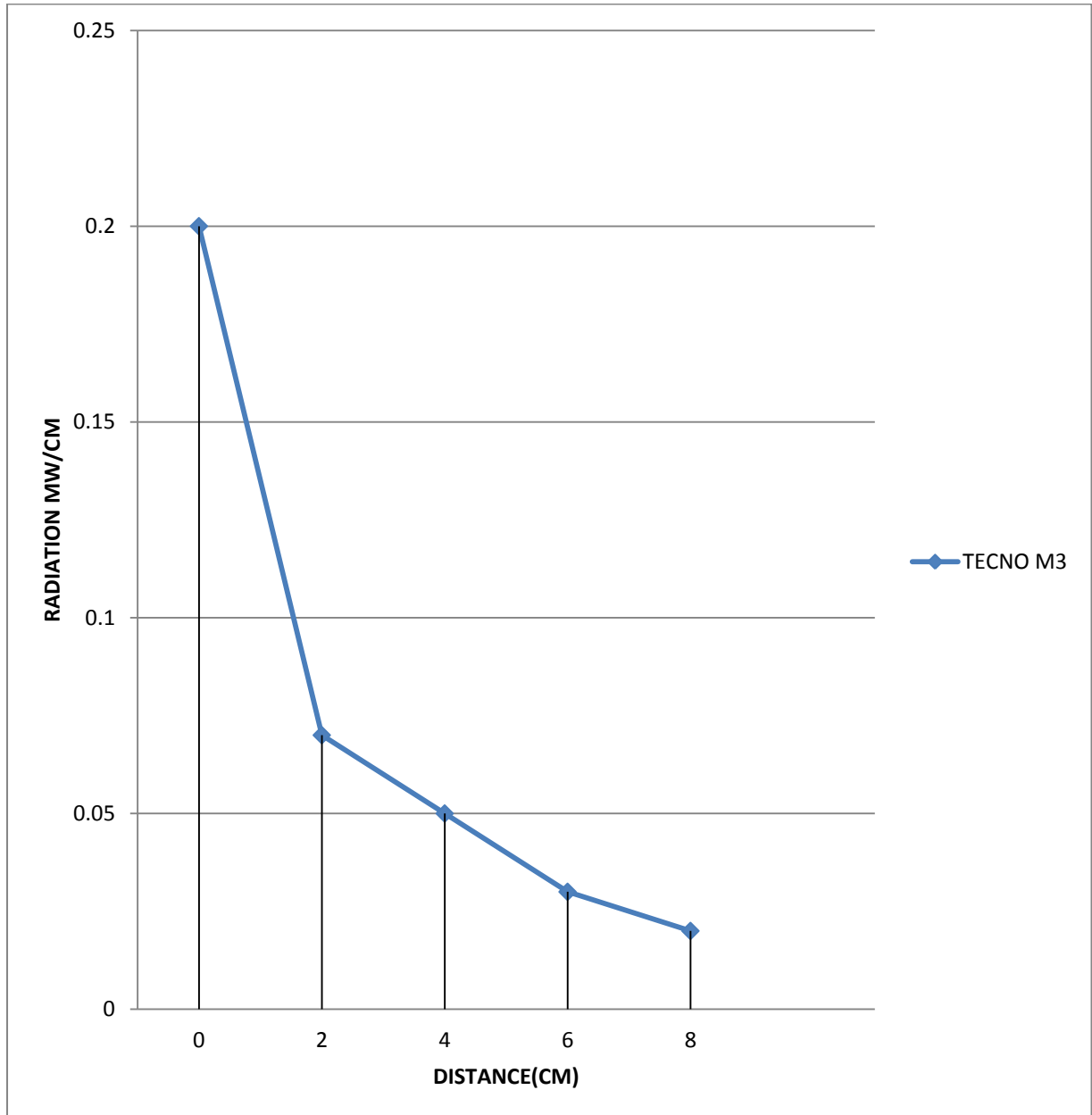


Figure 3. graph of Tecno M3 radiation level again distance in centimeter.

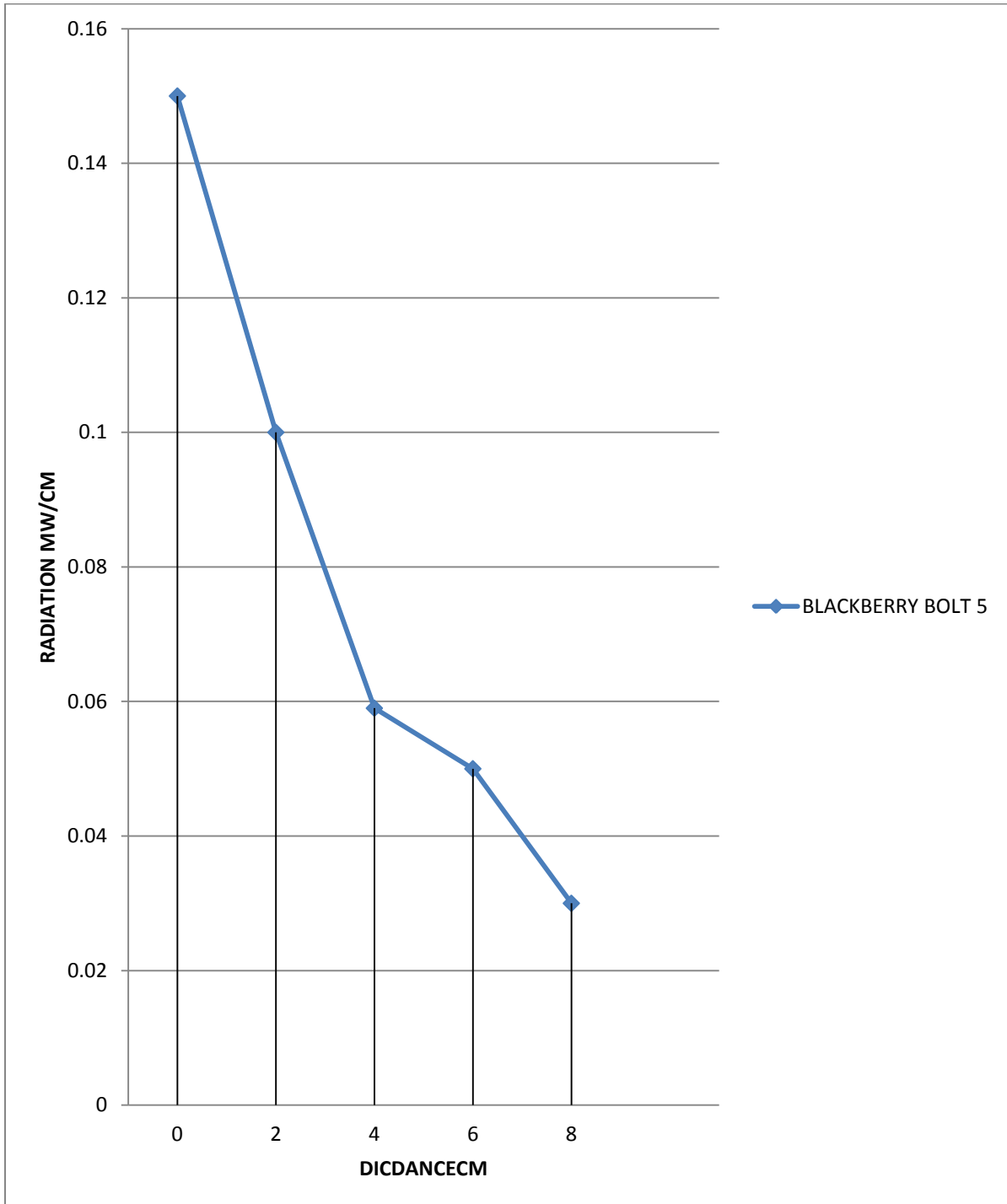


Figure 4: graph of blackberry radiation level again distance in centimeter.

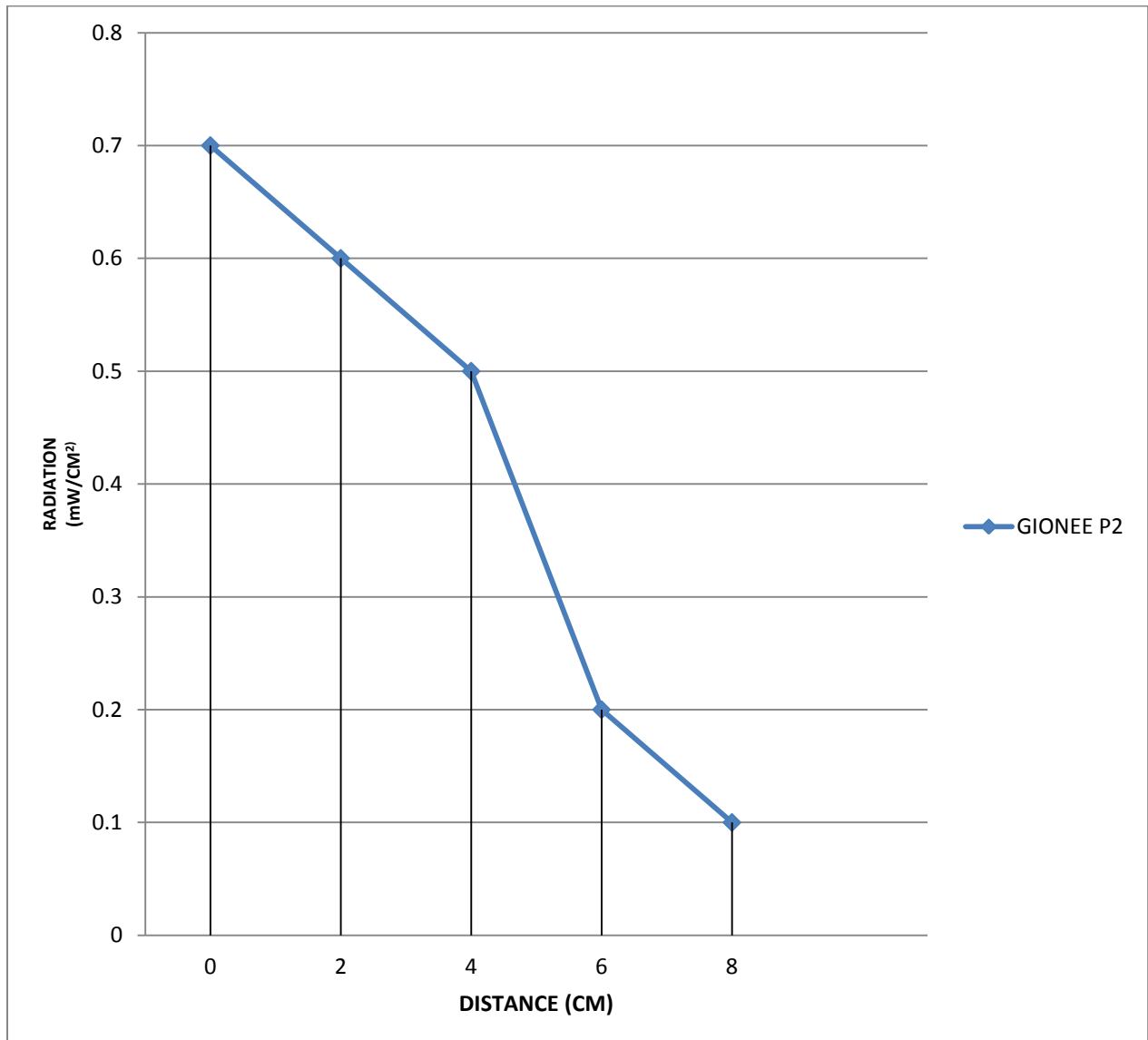


Figure 5: graph of Gionee p2 radiation level again distance in centimeter.

## DISCUSSION

It clearly shows that is not good to use cell phone next to the ear, because the radiation emitted is very high. Moving a cell phone an inch from the body or ear can greatly reduce radiation; signal strength falls off as the square of the distance to the source. This means that if you double the distance to the source which is the cell phone to your head, the signal strength would be four times less, since two squared is four. If you triple the distance the signal strength would be nine times less and it continues.



The less you talk on your cell phone, the less exposure to radiation you will have so by keeping voice conversation short, you're limiting your exposure.

Looking at figure 1 and 5 one can clearly demonstrated that the maximum high radiation of nokia and Gionee phone at a 0cm is 0.6  $\mu\text{Hz}$  to 0.7  $\mu\text{Hz}$  and this radiation is in medium class while the minimum radiation at 8cm is 0.1  $\mu\text{Hz}$  to 0.02 $\mu\text{Hz}$ .

Figure 2 and 3 shows that radiation emitted is very high ranging from 1.18  $\mu\text{Hz}$  to 0.15  $\mu\text{Hz}$ , this shows that the radiation may cause rich in human health intern of slowly emotion.

Furthermore figure 3 clearly shows that Tecno phone has low radiation ranging from 0.2  $\mu\text{Hz}$  to 0.02  $\mu\text{Hz}$ . the result of figure 3 give a room or advise to used such phone which has low radiation.

#### **ACKNOWLEDGEMENT**

First and foremost, I must show my appreciation to almighty God for all he has done for me. Also, my heartfelt appreciation goes to my brother and sisters for their love, they are in person of Maryam, Madu, Sarah, Blessing and Rejoice in using they Phones.

#### **REFERENCES**

- Aalto S., Haurala C., Brück A., Hämäläinen S. H., Rinne J. O (2006): "Mobile phone affect cerebral blood flow in humans" Journal of Cerebral blood flow and Metabolism org. 885-890.
- Binhi Vladimir N., Repiev A (2002): Magnetobiology: underlying physical problems. San Diego: Academic Press: pp 1-16.
- Delgado J.M, Lead J., Monteagudo J.L., Gracia M.G (1982): Embryological changes induced by weak, extremely low frequency electromagnetic field. Journal of Anatomy 134 pp 533-551.

- Hardell L., Mild K.H., Carlberg M., (2003): Further aspects on cellular and cordless telephones and brain tumours. *International Journal of Oncology*, 22: pp 399-407.

---

**Reference** to this paper should be made as follows: E. W. Likta. (2017), Observation of Cell Phone Energy Radiation Effect. *J. of Physical Science and Innovation*, Vol. 9, No. 1, Pp. 44-53

---