

**LEVY'S POWER CONSERVATION METHOD (LPCM) –AN
INNOVATIVE APPROACH FOR EFFICIENT POWER SAVING AND
REDUCED ELECTROMAGNETIC RADIATION STRATEGIES**

M. Levy*

Dr. Anh Van Dinh**

Dr. D. Sriram Kumar***

ABSTRACT

This paper presents a novel method of power saving and reduced electromagnetic radiation from antennas used in wireless mobile communications. Now-a-days seeing a person without mobile phone is very difficult. Even though people are worried about the electromagnetic radiation biological effects but using the mobile phone is in evitable. This paper a new method is proposed which can reduce the power consumed and electromagnetic energy radiated from the mobile antennas with the help of new design of mobile phones along with global positioning system. This is called Levy's power conservation method.(LPCM).

Keywords: *Electromagnetic radiation effects; Global positioning systems; Levy' power conservation method (LPCM); Power conservation techniques.*

*University of Saskatchewan, Saskatoon, Canada and National Institute of Technology, Trichirappalli, India.

**University of Saskatchewan, Saskatoon, Canada.

***National Institute of Technology, Trichirappalli, India.

1. INTRODUCTION

MOBILE phones are found everywhere in the world. The applications are such that today a person cannot think of living without mobile applications. New companies are on the line in producing different types of mobile phones which attracts different customers and can be used for different applications. Children are also using the mobile phones without knowing the adverse affects of the mobile phones. As science and technology progresses, on one hand we get a lot of good applications but it comes with some cost which we have to pay. Technically speaking it includes lot of new technological advances into effect but it steals the time which people previously had to spend with their co- fellows. Today we can see everywhere people talking to mobile phones longer time than to the people who are nearby them. School children and college students are using the mobile phones simply for chatting while the classes are going on and for viewing and circulating some video materials which is not at all needed for them. These are some of the social aspects. To a electrical and electronics techno craft what is concerned for him more is the life time and usage time of the battery which powers the mobile. To a medical practitioner what is more concerned to him is the impact of biological effects made on human being by the electromagnetic radiation from the antennas used in mobile applications. Some of the worst effects are Cancers, impotency, brain tumors etc., It has been medically proved that the people who are under the influence of electromagnetic field for longer time duration are more prone to this type of disorders ,worst affected than the people who are exposed for short duration. This paper makes an attempt to address the issues of both engineers and doctors. The proposed new method in this paper can be used effectively to overcome these shortcomings.

2. EXISTING METHODS

A. Base Station and Mobile Antenna

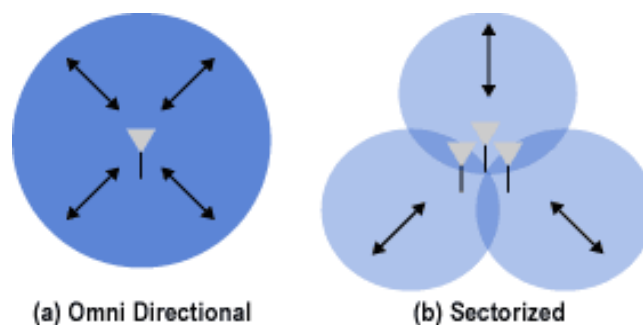


Fig 1. Non-Smart Antennas System

In all current mobile communication technologies, there is a cell, base station or base stations in each cell and number of mobile users will be attached to the base station. The base station continuously monitors the mobile users and keeps in touch with them constantly by sending pilot signals to the mobiles. The mobile receiver constantly receives the power transmitted by the base station and displays it continuously so that the user can easily view the strength of the signal. This can be treated as continuous wastage of power and continues electromagnetic radiation which increases health hazards.

B. Smart Antenna Technology

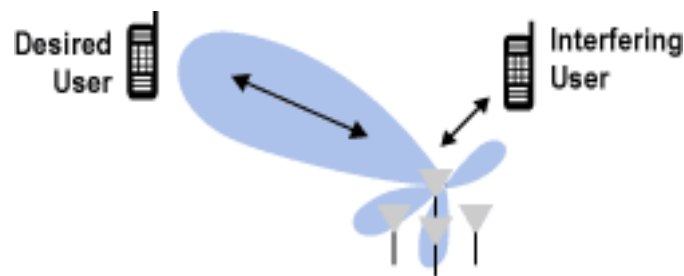


Fig 2. Smart Antenna System—Beam forming

Smart Antenna Technology uses the adaptive arrays at the base station which greatly increases the radiation in the desired direction and places nulls in the interfering user's direction. Smart antennas combined with CDMA technology promises many advantages in mobile communications. Some of them worth mentioning are increased range extension, reduced interference, increased CINR, increased data capacity throughput etc. The concept of SDMA i.e. space division multiple access greatly increases the capacity of the system to an extent beyond which it cannot be extended further for the given CINR. There are different smart antenna technologies available, plenty of beam forming algorithms are available with a wide variety of direction finding algorithms. Surely this addresses the issues of radiation and power concerns to a considerable extent and researches are still on to make the system better and efficient.

C. MIMO Technology



Fig 3. MIMO Concept

With the advent of latest Multi Input Multi Output (MIMO) technology, multiple antennas are used at both the transmitter side and receiver side. This uses a method of spatial diversity to increase the throughput. This can be considered as an extension of smart antenna technology with smartness placed both at the base station transmitter and mobile receivers. One problem with MIMO technology is the Eigen value should be available for each multipath for the algorithm to work efficiently. This needs the presence of lot of scattering objects and reflectors available in the path of propagation. Space time block codes are used to address some of the issues in MIMO. This technology doubles the advantages that we got with smart antennas.

3. PROPOSED METHOD

In the proposed technology the base station will be changed to green e-stations or simply green base stations (GBS) as a trend where every thing is changed nowadays towards green technology and e-applications like e-commerce etc., . There will be no continuous radiation but there will be Radiation on Demand (ROD). The ROD technique highly improvise power conservation and reduces radiation. Likewise the mobile phones are no longer called the same way which they are previously called but they are called as green e-mobiles or simply green mobile users (GMU) . The basic requirement here is the low power global positioning systems called green global positioning system (GGPS) which identifies each and every green mobile exactly and connects with its corresponding green base stations. It has been identified that by using a unique identification number each and every mobile in this universe can be numbered. This unique numbers can be used to identify the mobile, connect to base station to produce radiation on demand (ROD) and by using smart antenna technology the adaptive beam forming can be done.

4. LEVY'S POWER CONSERVATION METHOD (LPCM)

Consider a Single green station a two green mobile users and a green low power global positioning system. When there is no communication between A and B there will be no radiation at all. The mobiles will not radiate the base station will not radiate. But there is a small low power pilot radiation from Global positioning system. When user A wants to communicate to user B, when the first button is pressed a pilot signal will be transmitted to global positing system which identifies the location of the mobile and correctly activates the base station with in the limits of A. Now the base station establishes connection with A and gets the information to which it wants to communicate. When it gets the complete

information it communicates to the base station with in the limits of B through global positioning system. Once the connection between the two users is established the global positioning system can be signed off and the two users will communicate through smart antennas in their base stations. Once the communication is over, the link can be removed and the mobiles can be put in the idle state. In this way unnecessary transmission and reception of continuous radiation is reduced, battery power is saved and radiation hazards are reduced. Low power global positioning system plays a vital role in this technology.

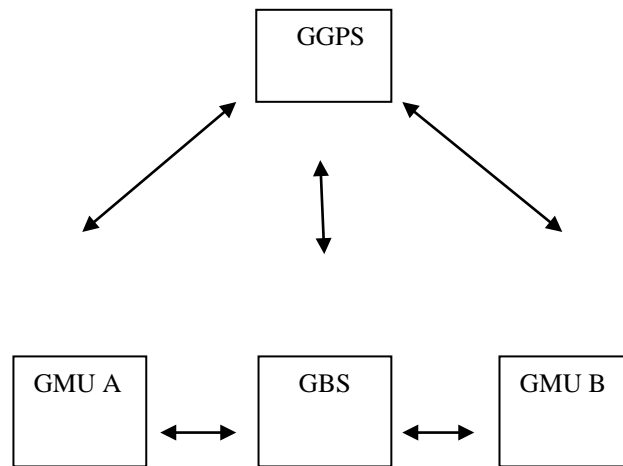


Fig 4. Levy's Power Conservation Method- Block Diagram

5. CONCLUSION

In this research article a new Green technology for mobile communication called Levy's Power Conservation Method (LPCM) is proposed. The future research effects can involve the replacement of global positioning system with the green station itself to reduce the overall cost of the system involved.

REFERENCES

- [1] R. Bolla, R. Bruschi, K. Christensen, F. Cucchietti, F. Davoli, and S. Singh, "The potential impact of green technologies in next-generation wireline networks - is there room for energy saving optimization?", IEEE Communications Magazine, August 2011.
- [2] M. Levy and Dr. D. Sriram Kumar, "Novel Algorithms for Rapid Beam Forming in Optical Antennas for Microwave Photonics Applications using Smart-Fractal concepts" ICON-RFW-41, IETE Conference, Bangalore, October 14-16, 2011.