

## Cylindrical Dielectric Resonator Optical Antenna (CDROA) and its Applications for Convenient Technology

Anand Mohan<sup>1\*</sup>, Ashok Kumar<sup>2</sup>

<sup>1</sup>JRF (DST) Govt. of India at C.M. Science College, Darbhanga, Bihar, India

<sup>2</sup>Dept. of Physics, MLSM, College, Darbhanga, Bihar, India

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**Abstract:-** The unique and special features of Dielectric Resonator Antenna (DRA) which has mainly focus on good quality communication with low profile Antenna. Cylindrical Dielectric Resonator optical Antenna (CDROA) is compact in structure, light in weight conformable to surface planar some natural carbon atom form hollow cylinder with out side diameter of only one nano meter. Dielectric Resonator Antenna is well suited for microwave devices integration and feeding Technique and, especially with the microwave integrated circuit technology. In addition, technological applications for such as direct broadcast Technique for satellite system on satellite communication at global positioning system (GPS) and high frequency navigation system and good accuracy and a large variety of radar systems demand for good quality Antenna for the best performance of antenna system.

**Keywords:** – DRA, Global positioning system (GPS) Antenna, satellite, Cylindrical dielectric resonator antennas (CDRA).

### I. INTRODUCTION

Wireless Mobile communication is developing very rapidly with passage of time. The high speed mobile approach to new technologies are being introduced to facilitate the mobile users from the technology[1]. The Dielectric Resonator Antenna has unique type of the antenna which can exhibit various advantages over conducting surface of antenna. The evolution in the field of microwave communication in the last two or three decades, especially that of the internet and the shrinking size of communicational devices likes mobile phones to pocket size smart phones/Android phone, have transformed the world into a global village CDRA has able to transformation and reform the size of the cylindrical dielectric resonator antenna is defined accordingly with its aspect ratio [2]. The Key Requirement for global positioning system (GPS) Antenna systems such as cellular system and indoor or, outdoor communication systems that is needed some more specific and additional features added to the antenna to compensate for the deficiencies and encountered in system for best performance. There are many method by which DRA have been designed by many researchers for various applications like DRA for Mobile Ad-hoc network & feeding technique although the DRA antennas are capable enough to fulfill all the operational requirements, the temperature conditions are constrained to face certain limitations to avoid these constraints performance of Dielectric Resonator Antennas (DRAs) is evaluated by their new applications are proposed [3, 5]. The antenna as per the requirement of various applications so it is necessary to find the control over bandwidth and gain the Antenna applications for tracking

and satellite. The Cylindrical Dielectric Optical Antenna (CDOA) great advantages over cylindrical and Rectangular shape antenna. The growth in wireless communication system are developing very high with pass age of time because the communication industry indicate a bright future for wireless networks both as stand alone systems and as part of the larger networking infrastructure. The many technical challenges remains in determining robust wireless networks that delivers the performance necessary to support emerging applications. In addition the Wireless Local Area Network (WLAN) currently supplement or replace and achieving tenability for optical frequencies although wire material operation conduction band interactions among (CDOA). The DRA dielectric resonator antennas (DRA) have been the interest of research and investigation due to its highly desirable characteristics such as small size, very-low Profile & highly efficient in microwave and mm wave spectrum. The Antenna is free to select the dimension of the antenna for a particular single frequency Type of antenna is a dual pattern diversity antenna to be used in the Body Area Network context. That gain of the antenna will increase if higher order mode is introduced in Dielectric Resonator. Modern communication system uses different Types of antenna for many communicational purpose and its made up materials antennas may be suitable from dielectric material are well seen in the devices and dielectric antenna has been the interest of researchers from the past few decades due to design suitability and flexibility Dielectric Resonator Antenna is well explained [6,7]. Antenna types are different & their shapes and sizes (dimensions) as according to the requirement by the transmitting or receiving device or the locality where it have to be installed. There are many

research papers and journals which have been published, which shows the works and findings of researchers about different characteristics and behavior of the dielectric antennas [DRA]. The antenna uses different feeding Technique for their excitation such as probe feed; lumped port feed, excitation by different fields and many more techniques are uses by which an antenna system for excitation [8,9]. But there are very few Research publications has focused on the experimental detail about the characteristic challenges remain in determining robust wireless networks that delivers the performance necessary to support emerging applications. In addition the Wireless Local Area Network (WLAN) currently supplement or replace and achieving tenability for optical frequencies although wire material operation conduction band interactions among (CDOA) [10, 12]. When we increase the dimension of the antenna in direction normal to ground plane, it improves the gain or directivity. Effect of the dielectric constants of the Dielectric Resonator box on bandwidth of the antenna as well as the effect of thickness of the substrate of the device. Dielectric Resonator Antenna can be changed by many methods of the variation in the position of bands in antenna as well as gain some of these are studied to find the control over bandwidth and gain of device.

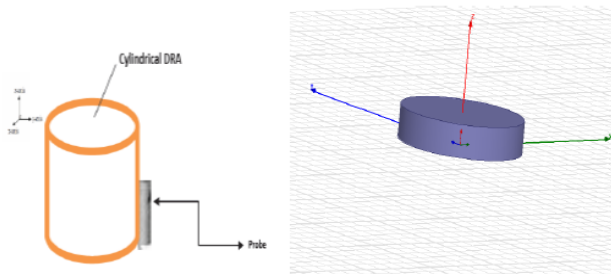


Fig.1 FCYLINDRICAL DIELECTRIC RESONATOR ANTENNA (DRA) FOR GPS

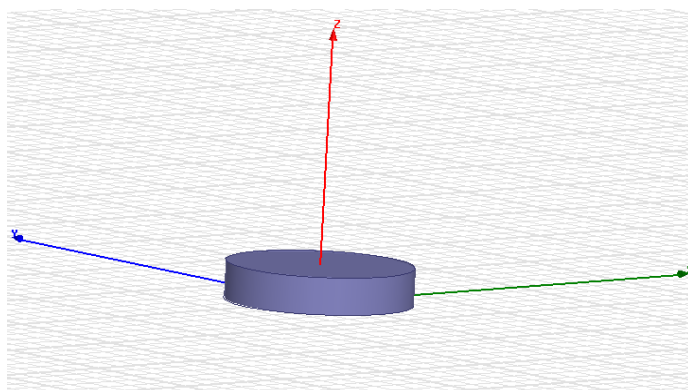


Fig.2 CYLINDRICAL COAXIAL PROBE FEED DIELECTRIC RESONATOR ANTENNA (DRA)

The other with non-planar feeds excited by planar- CPW but DRA excited by vertical monopole. Both types are has designed and measured upon body when configured into different propagation scenarios. Two methods of introducing the higher order modes have been verified. The Cylindrical DRA has great advantages over cylindrical and rectangular shape DRA. The optical antenna is a unique type of antenna i.e. working at optical frequencies. The main purpose of optical antennas is converting energy free propagating radiation to localized energy & vice versa. The growth in Antenna communication systems are developing very high with passage of time because the computers indicate a bright future for wireless networks, both as stand-alone systems and as part of the larger networking infrastructure. However the, many technical challenges remain in designing robust wireless networks that delivers the performance necessary to support emerging applications. The wireless local area networks (WLAN) currently supplement or replace wired networks in many homes, businesses, and campuses. Many new applications, including wireless sensor networks, automated highways and factories, smart homes and appliances, and remote telemedicine, are emerging from research ideas to concrete systems. It offers greater design flexibility, the resonant frequency and the quality of DRA is high. The cylindrical DRA can be fabricated very easier than hemispherical. Various DRA cylindrical models can be easily excited by radiation patterns.

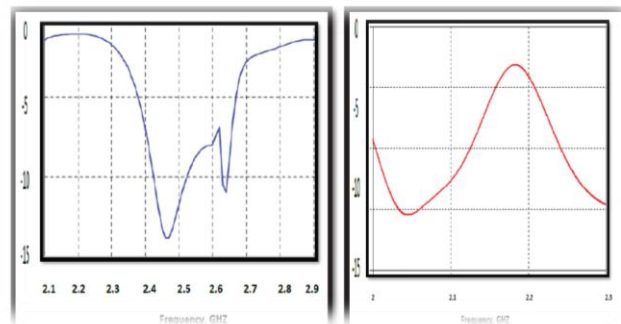


Fig.3 VSWR Vs frequency plot of a DR antenna

DRA Antenna system have been key approach for the cylindrical dielectric resonator antennas, Optical antenna area promising research & development area for their great potential application in various field of technology development & design at nano-communication range. Optical antennas diagram designing depend on the nonlinear response of dielectric nanoantennas.. The communication industry in field of wireless has captured the attention of the media and the imagination of the public, end users and

consumers. In the Fact, that the low-profile and & tinny antenna is good for any communication devices not only in mobile but also in GPS, Telemedicine because the new technologies in sensing, medical imaging and wireless data communications are allowing telemedicine to provide healthcare at a long distance with much lower cost than in the past, enabling the development of new widespread remote level medicinal initiatives for any system Which is based on wireless device to operate at nano-Frequency. In the radar technology tinny antenna is essential to reduce the weight of the radar, therefore, enable to smooth communication. Antenna can easily be characterized by its size, because it can easily manipulate and fabricate. DRA antenna can be replaced with efficient, tinny & low-profile antenna. Antennas performances are highly suitable for the development of modern wireless communications system. The Communications are becoming as a part of our lifestyle of human life because our daily life needs good quality antenna for best performances. The Cellular systems have experienced exponential growth over the last decade and there are currently around two billion users worldwide. Although proposed cylindrical antenna has earned much attention in the antenna propagation community between 1972 to 1974 i.e., about a decade before the inception of CDRA, and by the 1980s, it had occupied almost every sector of wireless & mobile communications system of our day-to-day life. The antenna plays an important role in our daily life, because we need to enhanced it bandwidth at optical frequency domain. Optical frequencies which does not present in nature. This provides possibilities to design unique types of properties such as negative retraction. Android mobile have become a critical business tool and part of everyday life in most developed countries, and are rapidly supplanting antiquated wire line systems in many developing countries. In addition, wireless local area networks (WLAN) currently supplement or replace wired networks in many homes, businesses, and campuses.

## II. CONCLUSION

In this research paper we have studied about cylindrical dielectric resonator optical antenna for GPS devices System and its operation area has been also proposed in this research paper. The microstrip line has improved & the performance of the CDRA has been enhanced in this methods. The proposed Cylindrical –optical DRA Antenna can be used for microwave & satellite communication applications have typically used at GPS band line where use of metallic losses. The main features of the proposed Cylindrical-DRA are its small size & low cost and high microwave frequency operation .C-DRA can be useful in GPS communication as it offers. In conclusion, this research comprises both theoretical and Simulation investigations. New types of applications, including wireless sensor networks, automated highways and factories, smart homes and appliances, and remote telemedicine, are emerging from

research ideas to concrete systems. The simulation work focused on the theoretical aspects of the cylindrical optical dielectric resonator antenna a single element and arrays with problem which ultimately leads to a general methodology for optimal antenna designs.

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**ABOUT AUTHOR-**

Anand Mohan is working as a Junior Research Fellowship (J.R.F) P.G Dept. of physics C.M.Sc College Darbhanga, Bihar, Graduate from Lalit Narayan Mithila University (LNMU) Physics, (Hons). He received the Post Graduate in MSc (Electronic) with Top Ranking (Gold medalist). Medal was given by Hon<sup>ble</sup> Speaker of LOK SABHA & CHANCELLOR of Central University of Bihar, His research interest include microwave applications, Nanoantennas applications, signal processing, Carbon nanotube, Nanoantenna and ultra wide band Applications & wave Propagation. He has published numerous research articles in National & International journals and conference proceedings, National seminar & symposium. Article was published in the 6th Bihar Science Conference, 2014 An International Conference on Science & Technology in 2014. He is also an INSPIRE Fellow from DST, Govt. of India as well as life member of the IASC, LASSI, IAPT, IST. He is member of editorial board of green earth research network (GERN) an international journal of all research. He is member of editorial board of International Journal of Applied Research, which includes:



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**Professor (Dr). Ashok Kumar** (Born on 20<sup>th</sup> July .1962) He did his M.Sc., in Physics with specialization in Electronics and Radio-physics in 1983 from L. N. Mithila University, Darbhanga (Bihar). He joined as a Lecturer in the Department of Physics in MLSM College, Darbhanga in 1985 He has keen interest in research activities. He did his Ph. D degree in 1990 from L. N. Mithila University, Darbhanga in. He has very successfully completed two Minor and one Major research project sponsored by UGC, New Delhi, Presently he is working as Professor in the Department of Physics MLSM College, Darbhanga, Bihar. He has got several research papers published in national and international journals. Several research scholars in faculty of science (Physics) have been awarded Ph.D. degree under his successful guidance and supervision. He is Life member of Laser and Spectroscopy Society of India, Department of Physics, Banaras Hindu University, Varanasi & Indian Association of Physics Teachers, Kanpur. Served as an expert member in the faculty selection committees of various Institutes, he received Indira Gandhi Sudbhavana Award for outstanding achievement in chosen field of activity International Business Council, New Delhi. He is presently a member of the editorial board of the of Airo International Research Journal Which **includes** IAENG, Hong Kong, bearing membership no. – 179517 dated 21 Nov. 2016 and a member of the following societies:



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