

# Chapter 4

## Reconfigurable Antenna System for 5G/6G

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### ABSTRACT

*The timely upgradation in 5G technology standards has already been released by third generation partnership project, which enabled the researchers to refine the research to improve the communication and support in the development. After development of fifth generation technologies, researchers, scientists, and engineers are looking for wide bandwidth which should improve wireless systems and devices to provide better services and experiences. Because of that, beyond 5G, a sixth generation is the next step to be widely used in early 2028 or intensively used around 2030 as per demand. Parameters like gain, bandwidth, efficiency, size of the antenna, technique of fabrication, and other useful quantities can be modified and maximized, and also the cost of fabricating such antennas will be reduced and developed.*

### INTRODUCTION

As growing demand of wireless communications as well as use of the integration of many number of wireless protocol into a single place, it is seriously important that all the polarizations of antennas can be re change for the use. Antennas which is reconfigurable can change their working frequency, all bandwidth including other parameters as per the demand of applications and requirement of systems. These antennas radiates lots of plots at different frequencies and polarizations simultaneously. According to as per today's requirement, design of such antennas which should be cost effective, giving all properties with easy integration like frequency, radiation

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pattern, polarization is a critical thing for design engineers. As moving from fifth generation to sixth generation, these procedure and derivations are good and nice to design these antennas for the lots of applications. Designing of any simple antenna and converting it a changing device by using other techniques to change structure by using physical and mathematical methods has been typical and challenging task. There are so many values as to be used such as getting all parameters throughout all the in fixed environment (Brown. 1998), (Erdil et al. 2007), (Grau, 2010). After that, based on these reviews there are several methods to use to find out changing properties and can be defined for these antennas that are classified as: (i) Electrical; (ii) Optical; (iii) Physical; (iii) antennas with smart materials such as graphene and gold, etc. Apart from that there are other techniques which is useful to defined the antenna characteristics as by using some semiconductor products like microwave switches, some high frequency diodes (Nikolaou et al. 2009). These diodes is widely used switch as it has acceptable performance and a low price compared to that switches and others. 1. Different methods to achieve reconfigurability:

### **1.1. Diode Such as PIN**

The electrical quantity of the this such as capacitance and resistance can play role to turn ON and OFF the diode for getting reconfiguration as forward and reverse bias (Quin et al. 2010). PIN diodes are mostly used diode which utilizes the exchange methods in many remote frameworks as per demand. For reconfigurable transmission and reception, an arrangement has been done such supply as DC and bias to work with it as to use it with radio frequency. There are one or two PIN diodes can be used with antenna design with any materials with designed frequency. As per various conditions of the PIN diodes, these two groups for the long term evolution including many frequencies for different ranges for applications. It requires a high speed, large current in the start and also taking care of this which should be taken care off. So, in any case, it is useful by giving decision for reconfiguration with minimal and solid effort get reconfiguration property as shown in figure 1.

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