

# Chapter 5

## Development of Novel Design to Enhance the Characteristics of Flexible Antenna

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### ABSTRACT

*This chapter proposed triple band novel geometry and enhanced characteristics of flexible textile antenna. The proposed radio wire indicates wideband execution with wide data transfer capacity of 20.50% covering the recurrence scope of 6.3039 GHz to 7.7445 GHz, 11.57% covering the recurrence scope of 9.0694 GHz to 10.184 GHz, and 8.23% in the recurrence scope of 12.497 GHz to 13.57 GHz. In this chapter, reenacted outcomes like return loss, directivity, and radiation characteristics have been contemplated.*

### 1. INTRODUCTION

The fast advancement of remote power transfer has expanded the interest for textile antenna with high gain and improved band attributes. Textile Antenna is exceptionally invaluable due to their successful cost, small profile, low mass and basic acknowledgment process. There are a great deal of strategies to expand the bandwidth of Antenna, by expanding the tallness of substrate,

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utilization of low dielectric substrate, utilizing various sustaining methods and by taking defected ground [1-5]. The proposed antenna configuration is utilized jeans as a substrate whose relative permittivity is around 1.7. Because of low dielectric constant the attenuation are exceptionally less and it likewise upgrades the data bandwidth of Antenna [6-9]. The initial phase in the plan of an antenna comprises of picking suitable material for the substrate and the directing part. Decision of choice of substrate the most appropriate substrate for an antenna involves prime significance. This is on the grounds that numerous restrictions of the microstrip wearable antenna, for example, exceptional reflection coefficient, and low gain of antenna [10-11]. The substrate properties, for example, its dielectric constant and loss tangent pronouncedly affect the antenna attributes.

A portion of the basic characteristics that are to be dealt with while choosing a dielectric are homogeneity and dampness retention. Consequently, we pick an uncommon sort of fabric (Jeans) with a thickness of 1 mm substrate. Low  $\epsilon_r$  of the reception apparatus substrate permits the structure of textile antenna with a vast gain and a high effectiveness [1]. After simulation it has been received the outcome, for example, reflection coefficient, gain and data transfer capacity. The real advantages of the antenna are lightweight, low creation cost, low upkeep cost and vigorous. Flexible antenna requires not as much of space for establishment as these are basic and little in size. The main space these need is the hole for feed line which is set at the back of the ground plane [12-13].

## **2. ANTENNA DESIGN PROCEDURE**

This paper presents the design of proposed antenna geometry and analyzed on simulation software. The antenna geometry consists of conducting patch, dielectric substrate material and a partial conducting patch used as ground plane. The copper is used to form the ground plane and radiating elements of the anticipated antenna. CST is used to simulate the anticipated design. Fig.1 illustrates the design of flexible antenna consist of partial ground, made of copper adhesive tape of thickness 0.038mm and substrate is made of jeans with thickness 1mm. The proposed antenna provides triple band and hence suitable for wireless communication system. The dimensions of ground are 30 mm and 86 mm. The general permittivity of jeans substrate is 1.7 with tangent digression of 0.025. The radius of patch is 14 mm with two square slots with measurement 5x5 mm and the width of feed line is 2 mm.

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