# Chapter 2
# A Hammer Type Textile Antenna With Partial Circle Ground for Wide-Band Application

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## ABSTRACT

*In this chapter, a partial circle ground textile patch antenna for wideband applications with better bandwidth is presented. The simulated antenna is proposed on textile jeans substrate having dielectric constant of 1.7. The radius of textile jeans substrate antenna is 15 mm. The overall simulation of partial circle grounded shaped antenna has been done using CST simulation tool. The simulated antenna resonates at frequency 9.285 GHz with the reflection coefficient of -28 dB. It covers a bandwidth from 7.008 GHz to 9.64 GHz. It has maximum directivity of 4.540 dBi.*

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## INTRODUCTION

Microstrip antenna comprises three most important parts which is substrate, patch, and ground. A dielectric substrate i.e. genes is sandwiched between radiating patch and partial ground plane. The conducting area is located on the dielectric substrate which is used as radiating element. On other side of dielectric substrate there is conducting layer used as ground part (Srivastava, Singh, Ali, and Singh, 2013; Wong, 2002; Singh and Naresh, 2015; Singh, Ali, Ayub, and Singh, 2014; Raghupatruni, Krishna, and Kumar, 2013; Balanis, 2004). There are a variety of methods for enhancing the bandwidth of textile microstrip antenna by expands the material depth, utilizing low dielectric material, using numerous feeding techniques and impedance matching. Both the bandwidth and the thickness of the antenna is contradictory assets i.e. enhancement in bandwidth increases the size & thickness of presented antenna (Srivastava, Singh and Avub, 2015; Loni, Avub and Singh, 2014; Singh, Ali, Avub, and Singh, 2014; Singg, Singh and Singh, 2014; Singh, Singh and Naresh, 2016; Gupta, Singh, Ali, Ahirwar, 2016; Din, Chakrabarty, Ismail, Devi and Chen, 2012).

Currently the fast improvement of modern communication systems is necessary for transportable devices for some important features which includes easy designing, light weight, small in size, compatible with microwave, millimeter wave integrated circuits, less production cost and easy fabrication of microstrip antennas. The microstrip antenna has abundant useful properties which includes tiny size, low-cost of the fabrication, light weight, ease of setting up but the main limitations of printed antennas remains their narrow bandwidth features which restrictions the range of frequency such that the antenna be able to work efficiently. In wireless communication system, microstrip antenna plays major role. These are used in high performance aircrafts, radar, missiles and other spacecraft. It has many advantages such as its light weight, simple structure, ease of addition and less cost. Microstrip antenna requires very less space for installation as these are simple and small in size (Baudh, Kumar, and Singh, 2013; Srivastava, Avub, Singh, 2014; Loni and Singh, 2015; Ddhupkariva and Singh, 2015; Singh, Singh and Naresh, 2015a; Singh, Singh and Naresh, 2015b; Ali, Singh, Kumar and Shahanaz, 2011).