

## Chapter 4

# Design of Slotted Hexagonal Wearable Textile Antenna Using Flexible Substrate

**Lalita Kumari**

*CBS College of Engineering and Management, India*

**Lalit Kaushal**

*CBS College of Engineering and Management, India*

**Deepak Kumar**

*CBS College of Engineering and Management, India*

### ABSTRACT

*In this chapter, a dual wideband textile antenna is proposed for WLAN and WiMax application. For antenna to be wearable, jeans material is used as a substrate to make ground plane, and copper tape is used to make patch of the anticipated antenna. The proposed antenna shows dual band performance with bandwidth of 82.48% covering 1.456 GHz to 3.5 GHz and 13.39% covering 4.32 GHz to 4.94 GHz. The simulated results like reflection coefficient, directivity, and radiation characteristics have been studied and analyzed.*

### INTRODUCTION

Textile Antennas are invaluable as a result of their compelling cost and straightforward acknowledgment process. There is a great deal of strategies to build the bandwidth, by expanding the thickness of substrate, utilization of

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low dielectric substrate, utilizing various nourishing systems and by taking fractional ground (Klemm, Locher, and Troster, 2004). The proposed antenna configuration is utilized jeans which improves the bandwidth of antenna (Singh, Singh, and Singh, 2015; Bappaditya, Bhatteerchya and Choudhury, 2013; Xu and Li, 2012).

Another period for the attire industry is the reconciliation of gadgets into textile messengers. The article of clothing of things to come won't just ensure the human body against the limits of nature yet additionally give data about the wearer's condition of wellbeing and condition (Bappaditya, Bhatteerchya and Choudhury, 2013) appeared in Figure 1. This work not just goes for growing such wearable textile systems mostly for expert firemen and crisis calamities work force yet in addition for regular citizen casualties of common and different catastrophes. The fireman's inward and external article of clothing is being outfitted with an assortment of sensors (Bappaditya, Bhatteerchya and Choudhury, 2013). This off-body correspondence requires the improvement of appropriate antenna that consolidates adaptability with heartiness and unwavering quality. An assortment of antennas for body-driven correspondence has been presented as of late (Grilo, and Correra, 2015; Rawat and Sharma, 2014; Chandran and Scanlon, 2010; Osman, Rahim, Samsuri, Zubir and Kamardin, 2011; Singh, Ali, Avub, and Singh, 2014). Because of the special shape and conservativeness, textile antennas have turned out to be most appropriate for coordination into articles of clothing (Srivastava, Singh, and Avub, 2015; Singh, Ali, Avub, and Singh, 2014; Singh, Singh, and Singh, 2015).

Radiating patch and ground of antenna is made of copper self sticky tape. Reproduction is finished by utilizing CST programming studio and gives the outcome, for example, reflection coefficient, addition and data transmission. The real advantages of the material radio wires are lightweight, low manufacture cost, low upkeep cost and hearty. Flexible antenna requires less space for establishment as these are basic and little in size. The main object is the hole for feed line which is put at the back of the ground plane (Srivastava, Singh, Ali, and Singh, 2013; Din, Chakrabarty, Ismail, Devi and Chen, 2012; Srivastava, Avub, and Singh, 2012).

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