A C-Slotted Dual Band Textile Antenna for WBAN Applications

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Abstract— **A dual band C-shaped slotted textile antenna with artificial magnetic conductor (AMC) is investigated in this paper. The proposed antenna is operates in the 2.45 GHz (lower) frequency band for WBAN applications and in the 5.8 GHz (upper) frequency band for WLAN applications. A diamond-shaped AMC is used to improve the antenna performance and reduce backwards radiation for on-body usage. The proposed antenna is fully fabricated using textiles and utilizes felt as its substrate and ShieldIt Super as its conducting elements. Simulations and comparison against a same antenna without the AMC plane indicated that this conformal antenna operates with good reflection coefficients, gains, and radiation pattern within the desired bands.**

Keywords—**Dual band antenna, textile antenna, artificial magnetic conductor (AMC).**

International Commission on Non-Ionizing radiation Protection (ICNIRP) stated that human can absorbed limit 1.6W/Kg per 1g of tissue and 2W/Kg per 10 g of tissue respectively [1]. One of the solutions to controlling the level of back-radiation is to either choose a topology with a ground plane or to introduce a metallic plane to function as a reflector. This work chooses to investigate the second option. An artificial magnetic conductor (AMC) layer is integrated with a slotted patch antenna for operation the WLAN/WBAN bands. The antenna is designed to for a dual-band operation in the lower band (from 2.4 to 2.484 GHz) and upper band (from 5.15GHz to 5.8GHz) [2-3]. To validate the effectiveness of the proposed AMC, the performance of the proposed C-slotted antenna is compared with and without the AMC.

II. Antenna Design and Materials