ABSTRACT

Today the development of wireless technology is very rapidly. Wireless technology is an important part in the development of communication systems. One of the wireless technologies developed today is the Wireless Body Area Network (WBAN) which is part of the Body Centric Wireless Communication (BCWCs) technology. The WBAN consists of several sensor units placed on the body or close to the human body. This technology is widely found for health applications, such as ECG, blood pressure, wearable sensors and oxygen levels. Inside the device, there is an antenna that is used to convert guided electromagnetic waves into electromagnetic waves in free space or vice versa. The antenna has grown and has been realized using a flexible material that can be safely used by humans.

In this final project design and simulation of a microstrip antenna at the frequency (3.1 - 10.6) GHz that can be implemented by using substrate materials such as hypafix plaster. As for the design of patches and ground plane using copper tape material that can be flexible to stick to the surface of the human body. In this design, the human body is replaced with a phantom model consisting of several layers of the human body. The Phantom model used in this study is a model of the chest with a layer consisting of skin, fat and muscle. This study discusses the effect of antenna placement distance from the body. Parameters to be seen are VSWR, impedance, radiation pattern, and gain. Simulation of an antenna using Computer Simulation Technology (CST) software Microwave Studio.

The antenna is able to work well in the UWB frequency range at a distance of 4 mm from the body with the characteristics, VSWR $\leq$ 2, positive gain, impedance 75.441+j 11.06 Ω at 6.85 GHz frequency and unidirectional radiation pattern.

Keywords: Body-centric, UWB, WBAN