ABSTRACT

Monitoring the body's health is a crucial aspect for the continuity of life. This monitoring process can be carried out practically with technological support, including one through the use of antennas. Antenna technology is currently experiencing rapid development, including the application of antennas to textile materials, enabling direct placement on the body for sensing purposes. One solution that fulfills this need is a device known as a 'wearable antenna.' A wearable antenna is a type of antenna that can be applied to clothing or directly on the human skin. Generally, wearable antennas use microstrip antennas, which are flat antennas that have the advantage of being thin, small in size, and with lower gain (signal amplification) due to their compact size.

The chosen antenna for the wearable antenna application is the circular patch microstrip antenna, which exhibits better parameter values compared to dipole antennas. This is mainly attributed to the substrate being fabric material, resulting in lower conductivity values for dipole antennas compared to microstrip antennas. Additionally, microstrip antennas with circular patches are lightweight, easy to fabricate, and offer advantages over linear dipole antennas. The designed microstrip antenna for this device uses cordura fabric as its substrate.

The testing system for the wearable antenna was conducted with a frequency specification of 2.4 GHz. The antenna testing process involved experimentation in the system, specifically with 5 samples of normal breathing and 5 samples of deep breathing. Based on the testing, there was a significant difference observed in the return loss, which showed more pronounced changes during deep breathing compared to normal breathing. This is due to the fact that deep breathing causes a more significant alteration in the curvature of the antenna, primarily because of the larger changes in the size of the chest cavity.

***Keywords** : Wearable antenna, Microstrip antenna, Cordura, Circular, Dipole*