

ABSTRACT

Ultra-Wideband Radar has been studied for many applications in the health sector, for example, vital sign monitoring, measuring physiological parameters such as heart rate, body temperature, and blood pressure. UWB has several advantages including having a wide bandwidth that supports high resolution does not require direct contact tools on the human body, and non-ionizing radiation so it is safe when penetrating biological tissue. Therefore UWB radar is often used in various applications on the radar, especially in the health sector.

UWB radar breathing detection requires an antenna with UWB characteristics. In this Final Project research, Vivaldi antenna is proposed as a UWB antenna for respiration radar with a frequency range of 3 to 6 GHz. Simulations and measurements have been carried out to evaluate the characteristics and performance in supporting radar respiration operations. The proposed Vivaldi antenna has been printed using the FR-4 substrate with a relative permittivity of 4,3 and a thickness of 1,6 mm. simulations and measurements show that the proposed antenna has UWB characteristics required by the respiration radar. The proposed antenna has a bandwidth impedance of 3 GHz to 6 GHz.

Regarding the minimum contribution, the transmission coefficient from the antenna transmitter to the receiver indicates that the antenna has a linear phase response. The experimental results in respiration radar models indicate that the proposed antenna can be used to identify signals that are reflected from the chest wall when inhaling and exhaling. Reflective signals from two different respiratory volumes have also been well identified.

Keywords: Ultra Wide-Band, Respiratory Detection, Antenna Vivaldi, Radar.