

ABSTRACT

Coronavirus Disease 2019 (COVID-19) is one of the pandemics that occurred in Indonesia. In November 2019 this virus began to be detected by the world and was declared a dangerous virus including the way it spreads so quickly and will have an impact on inflammation of the respiratory tract. Inflamed lungs will swell and can even fill with fluid in the lungs. X-ray results will be dark if the lungs are normal, while the results will be white if the lungs have been covered with fluid or have other damage. Scans using X-rays also produce different colors if there is damage to the lungs. Therefore, scans using roentgens or X-rays can show the results of lung conditions that have Covid-19.

Radar based on FMCW (Frequency Modulated Continuous Wave) technology can be one of the tools used as early detection and can be an alternative because the radar can emit low-power electromagnetic radio waves, so it can determine the level of wetness of the lungs of the patient and can know that the patient already have symptoms of Covid-19. To improve the performance of the radar antenna in this study, an antenna array that was arranged in 2x2 was designed and realized using Rectangular Microstrip. Antenna designed using antenna designer software.

The design of the antenna is carried out in two stages, namely simulation which is carried out in the form of antenna design for one element and then the element is designed into a 2x2 antenna array and fabrication. After manufacturing, the antenna that has been designed is tested to determine the performance of the antenna. The realized 2x2 antenna array in this study works at a frequency of 10 GHz (S-Band) with a *unidirectional* radiation pattern, with a return loss value of -21.635 dB, a VSWR value of 1.181, a gain of 11.2 dBi and a bandwidth of 88.44 MHz.

Key words : *Array antenna, rectangular microstrip, Array, FMCW radar.*