ABSTRACT

Circularly Polarized Synthetic Aperture Radar (CP-SAR) technology installed on an Unmanned Aerial Vehicle (UAV) is an alternative to cameras for mapping the earth's geographical conditions. CP-SAR is a technology that uses the working principle of radio detection and ranging (RADAR). RADAR requires an antenna that has high directivity and gain in order to detect objects on the earth's surface properly. High directivity and gain can be obtained by using an antenna array or the arrangement of antenna elements. However, the use of arrays causes the side lobe level value to increase so that it causes channel interference. An antenna array configuration and techniques are needed so that the antenna can produce an antenna array with high gain and directivity, appropriate bandwidth, low side lobe level, and also circularly polarized

In this study, the antenna is arranged using the series-fed array method, which can increase the gain value and the rectangular patch antenna will be truncated so that the antenna polarization becomes circularly polarized. The patches of antenna are also designed with different dimensions (taper patch) to reduce the side lobe level and achieve the required parameters. The antenna works at the S-Band frequency of 2400 MHz which is commonly used for radar frequencies. The feed used in the antenna is a microstrip line feed and the antenna is made using FR4 substrate which is easy to obtain and easy to integrate

This research is about a microstrip array antenna with a series-fed array configuration and a truncated taper patch that works at S-Band frequency of 2400 MHz with a bandwidth of 94.8 MHz, produces a gain of 5.037 dB, a side lobe level of -12.4 dB, and is circularly polarized to detect objects with CP-SAR.

Keywords*: *Microstip antenna, series-fed array, CP-SAR