

ABSTRACT

5G technology is currently being developed to meet the needs of users who demand more speed, this means that in 5G technology there is a need for large channel capacity. Multiple Input Multiple Output (MIMO) systems can increase channel capacity. The MIMO antenna system is not only influenced by the distance and number of antennas, but is also influenced by the configuration and drafting concept of the antenna. In some studies mutual impedance can affect the value of canal capacity. Another study says polarization arrangements can reduce the value of mutual coupling to low so that it can increase the value of mutual impedance.

This Final Project research analyzes the effect of polarization setting on channel capacity by using a Circular mimo microstrip patch antenna at a frequency of 3.493 GHz made from FR-4 substrate with (ϵ_r) = 4.3 and a thickness of 1.6 mm. The design uses a truncated technique and coaxial probe. The first step is to design a single antenna element according to specifications, after that it applies it to the MIMO sistem by comparing the skenario with the configuration of *polarization* and cross *polarization* using Left Hand Circular Polarization (LHCP) and Right Hand Circular Polarization (RHCP).

The results showed that polarization settings affect the mutual coupling value and spectral efficiency with the results of cross-polarization arrangement better than Co-polarization in simulating but in measuring results show results As opposed to the highest mutual value coupling-26.5087 dB at S23 *Cross-polarization* and-21.7646 dB at *co-polarization* S13 antenna. The design simulation result of MIMO *co-polarization* and *cross-polarization* antenna with minimum configuration indicates that the proposed antenna meets the specifications of the S-parameter value and bandwidth though at the lowest SNR (Signal to noise ratio) with Spectral efficiency values of 6.454 bps/Hz and 6.472 bps/Hz at the lowest SNR value of 5 dB.

Keywords: MIMO, polarisasi, kapasitas kanal, *mutual coupling*, RHCP,LHCP.