

## ABSTRACT

The newest wireless telecommunication technology that is developing today is 5G. 5G comes with very low latency and ultra reliable connections to set up the mobility of high speed communication. One antenna technology that can support the technology is Multiple Input Multiple Output (MIMO). MIMO can transmit the same information from two or more transmitting antennas can thus reduce the information lost on a single antenna. However, the use of more than one antenna makes the antenna elements have a close distance, resulting in the effect of mutual coupling. Mutual coupling can reduce the performance of the antenna, for that the value of the minimum mutual coupling becomes an important parameter.

In this final project will be designed microstrip antenna MIMO circular patch with co-polarization using Electromagnetic band Gap (EBG) method to reduce the value of mutual coupling. Research focuses on testing the value of mutual coupling contained in the MIMO antennas by placing the EBG structure between the antenna elements as a solution to reduce the mutual coupling value in MIMO antennas.

The results of the study in this final project showed that the addition of the EBG method carried out on the MIMO Co-Polarized RHEP antenna succeeded in reducing the value of mutual coupling at the largest of -3.93 dB at S13 with a mutual coupling value before the addition of the EBG method of -27.93 dB and after the addition of the EBG method of -31.863 dB at a frequency of 3.5 GHz..

**Keywords:** MIMO, *Mutual Coupling*, EBG