# ABSTRACT

In the future, the use of devices to communicate with each other (machine-to-machine) with high data rate and channel capacity is needed so that communication between devices can be done in real-time. To meet these demands, the next generation wireless communication system applies 5G networks. One of the solutions offered is the MIMO antenna. MIMO can also be applied to the use of Wi-fi. With the development of capabilities on Wi-fi, it can help in the field of information systems in industrial and other uses. There are problems in the MIMO antenna, namely the decoupling effect because of the location of the adjacent antenna and the value of the antenna parameters (return loss, bandwidth, and gain). Decoupling effect will affect the performance of the antenna in the transmit and receive process on the MIMO antenna.

In this final project, the design and analysis of 2x2 MIMO antennas working on the 2.4 GHz frequency for Wi-Fi devices with the distance between adjacent antennas and small dimensions but still consider the value of the antenna parameters. The antenna made in this final project is a 2x2 MIMO monopole antenna to eliminate the decoupling effect by adding a Resonator and Interdigital Capacitor method and a Complementary Split Ring Resonator (CSRR) on the ground. This design is then called a modified Resonator with Interdigital Capacitor and Complementary Split Ring Resonator (M-Resonator IDC-CSRR).

Based on the needs of Wi-fi devices, namely devices that can work well at wide coverage and are able to serve high data rates. The study results obtained have met the requirements, namely the value of return loss antenna -17,784 dB which means that it has met the standard <-10 dB with a decoupling value of -12,871 dB, the bandwidth 644,3 MHz, and the gain 1,996 dB.

**Kata Kunci :** MIMO, Resonator, *Interdigital Capacitor*, *Decoupling*, CSRR.