

## ABSTRACT

*5G Technology demands a communication channel with bigger capacity for the user needs. One of the methods to provide it is with using MIMO (Multiple Input-Multiple Output) antenna. With a consideration of low mutual coupling so the power that been unleashed will not be received by other antennas*

*This final project study and simulate MIMO 4x4 with five design. The first and second design is co-polarization while the third, fourth and fifth design will be cross-polarization, with 3.5 GHz frequency that has been prepared by Minister of Communication and Informatics, microstrip antenna with circular patch and truncated methods. The simulation will start by designing the single antenna which will be used for model for MIMO 4x4 antenna after meet some requirement*

*At the result of return loss simulation, polarization arrangement didn't give much impact for the frequency spectrum value, but it gives pretty significant impact to the value of return loss, 1<sup>st</sup> design have the lower average than others design. Polarization arrangement also gives some difference in mutual coupling simulation, 1<sup>st</sup> design lowest mutual coupling value is -59.45 dB, 2<sup>nd</sup> design is -56.20 dB, 3<sup>rd</sup> design is -50.64 dB, 4<sup>th</sup> design is -49.48 dB and 5<sup>th</sup> design is -68.81 dB. 1<sup>st</sup> design and 2<sup>nd</sup> design which are co-polarization has lower mutual coupling value than cross-polarization from 3<sup>rd</sup> and 4<sup>th</sup> design. But 5<sup>th</sup> design which is cross-polarization has lowest mutual coupling value, but theres some specification that it not fulfilled*

*Keywords : antenna, MIMO, return loss, bandwidth, polarization, co-polarization, cross-polarization*