# ABSTRACT

In a communication system, the coverage area is very important. There are still the blank spot in the coverage area of base stations leads to reduced the customer satisfaction. Location is not uniform and geographical conditions, cause the certain areas that can not receive signals from the microcell base stations. It takes a special design to minimize the blank spot areas, and increase the average of received power and SIR thus guaranteeing a good quality communication services.Computer Systems Laboratory and CNC Laboratory in IT Telkom are the room that requires a high communication services, but the signal from the nearest BTS makrocell was not optimal forward the signal to the inside of the room. So it is required the planning of the placement and configuration of antenna for indoor femtocells in this room.

In this final project will discuss the design of antenna configurations that may be compatible with the antenna system that match for femtocell applications. An antenna configuration to 4 × 1 antenna elements and antenna placement are changed three times will be studied in this final project. And then performance with the same antenna configuration will be simulated in the RPS and will be compared using Cost 231 Indoor and 3D Ray Tracing propagation models.

The simulations show that the most optimum configuration for the Computer Systems Laboratory is the 4x1 elements at the second location for Cost 231 Indoor model and at the third location for the 3D Ray Tracing model. While the optimum configuration of CNC laboratory is the 4x1 element at a second location for Cost 231 Indoor model and 3D Ray Tracing.



Keywords: Coverage area, Blank spot, SIR, The average of received power, Femtocell, Cost 231 Indoor, 3D Ray Tracing