ABSTRACT

The availability of frequency resources for communication are very limited. Therefore, it is necessary to divide the frequency usage for each type of communication. The fifth generation (5G) which will be implemented in 2020 has several candidate frequencies including 3.5 GHz. This frequency is also used as a satellite frequency. Therefore, the antenna radiation pattern for the 5G base station is designed not to interfere with satellite ground stations. In this Final Project will only focus on the antenna that will be used for the 5G base station.

The antenna to be designed and realized is a dipole array antenna with a reflector which will be placed on the base transceiver station. Circular array antennas are used because they have high gain so they can have larger coverage. The reflector functions to reflect the signal, so that it has a blank spot so it does not radiate the signal to the satellite ground station. The focus of this Final Project is on the shape of the antenna radiation pattern.

This Final Project designs an antenna using software and realizes a dipole array antenna with a reflector using copper with a diameter of 4 mm. The antenna's working frequency is 3.5 GHz with a bandwidth of 200 MHz. The antenna realization results obtained omnidirectional radiation pattern which has a blank spot in the direction of 270º and the bandwidth, return loss, VSWR, and gain values fulfill the specifications so that the antenna can be implemented for 5G communication at the base transceiver station.

Keywords: 5G, radiation pattern, dipole array antenna