ABSTRACT

The main problem in antena design for 5G transmission is the need to maintain a compact antena size while achieving high gain. Microstrip antenas are often used due to their small size; however, in 5G applications, there is a challenge in achieving sufficient gain without significantly increasing the antena's dimensions. This limitation is the primary focus of this research.

The proposed solution is the development of a microstrip antena integrated with a metasurface and amplifier. The metasurface is used to enhance the radiation efficiency and gain of the antena, while the additional amplifier helps to increase output power without sacrificing the antena's size. This design is intended to operate at a frequency of 3,5 GHz, aligning with 5G transmission standards.

The measurement procedure was conducted through simulation and prototype testing. The testing was carried out to measure the antena's gain, return loss, and radiation efficiency at various frequencies. The test results show that the antena with metasurface and amplifier can maintain a compact size while achieving the desired gain, making it an effective solution for 5G applications.

Keywords: Microstrip Antena, 5G, Amplifier, Metasurface, Measurement Procedure