ABSTRACT

Satellite Communication Technology is a telecommunications technology, where satellites are communication devices placed in space and require spectrum frequency allocation for telecommunications services. The most commonly used frequency for satellite communication antennas is the C-Band frequency. Antennas are necessary to transmit and receive electromagnetic waves as communication links between earth stations and satellites. The widely used antenna in satellite communication is the parabolic reflector antenna due to its high gain value and good focusing capability. In this research, a Cassegrain parabolic antenna is designed at a working frequency of 6.15 GHz using CST Suite Studio 2019 software. Two different feed horns, pyramid, and conical horn, are used in the design to compare the antenna's performance parameters. To obtain the antenna's parameter results, iterations are performed on the antenna's dimensions and geometry. The simulation results of the radiation pattern and gain of the Cassegrain antenna with different feed horns indicate that the conical horn shows good results. The radiation pattern is directed towards the main lobe at 90°. The sidelobe value is low at -28.2 dB, and the beamwidth is 0.2°. The gain measurement results of the different feed horns show that the conical horn produces a large gain at the working frequency of 6.15 GHz, amounting to 41 dBi. The return loss value obtained is -28.16 dB, VSWR is 1.03 with circular polarization. The cross-polarization results of the Cassegrain antenna with the pyramid feed horn yield a value of 15.8 dB, whereas the cross-polarization with the conical feed horn results in a value of 33.9 dB.

Keywords: satellite communication, C-Band frequency, Cassegrain* antena, *radiation pattern, gain.