ABSTRACT

Natural disasters and non-natural disasters are undesirable events. Earthquakes, terrorism, fires and other events that occur in a closed room will affect the structure of the building. The limitation of the human senses to see becomes one of the problems if. Therefore the role of radar to detect objects behind a barrier or wall is needed to overcome the problem to plan the next step in overcoming the problem.

Radar must have high accuracy and sensitivity to obtain an overview of the target. To achieve this, bandwidth must be wide, therefore an X-Band antenna is needed. An X-band antenna is an antenna that operates at frequencies of 8.0 – 12 GHz for translucent radar according to the Institute of Electrical and Electronic Engineers (IEEE). For the study, vivaldi microstrip antennas were conceived or also called arrays to increase greater gain for smaller beamwidths as well as increase signal to inference plus noise ratio. The selected microstrip antenna is a vivaldi-shaped microstrip antenna. The vivaldi patch-shaped antenna was chosen because it is effective for frequencies exceeding 1 GHz. For the selection of antenna substrates selected Rogers Duroid 5880 because it already supports X-Band frequencies.

In this research, design and simulation was carried out using the CST Studio Student Edition 2018 program to implement a microstrip antenna arrangement Vivaldi antipodal x-band for translucent radar that is expected to meet the specifications of translucent radar. Results obtained from a series of optimization and analysis, obtained vswr results worth less than 2 dB and return loss of more than -10 db. While the gain obtained is worth 9.71 dB and the radiation pattern is unidirectional.

Keywords: Microstrip antenna, Vivaldi, Array, antipodal circular load,VSWR,return loss,gain.