# ABSTRACT

Synthetic Aperture Radar is one type of radar for capturing two-dimensional and three-dimensional digital imagery. SAR uses an antenna mounted on a moving object at a certain height to observe a region. The antenna emits sinusoidal electromagnetic waves continuously in the form of pulses reflected by the surface of the object and then received and processed into imagery. This SAR technology is expected to produce high resolution images. For that, a uniplanar antenna with a reflector that has a very wide frequency band (ultra wideband) with unidirectional polarization is needed.

In this undergraduated thesys, antennas working at a frequency of 2450 MHz are designed and analyzed using the fractal *koch snowflake* method, in order to obtain smaller antenna dimensions and *bandwidth* of ultra wideband more than 500 MHz or 20% of the antenna working frequency. Design and simulation are assisted by software to obtain the optimal antenna performance. The antenna uses Rogers RT5880 *substrate* material as well as copper for *patch*es and *groundplane*s.

Based on the analysis of the design results, it is obtained an antenna characteristics such as, *bandwidth* with an upper and lower limit at a maximum VSWR of 1,5 with a return loss value of -14 dB is 600,9 MHz. The antenna has a unidirectional radiation pattern with a *gain* of 7,8 dB, circular polarization in the direction of Right Hand Circular Polarization (RHCP) which is measured in the 90° phase direction, and the resonant frequency at 2450 MHz has a VSWR of 1,007 with a return loss value of -50,76 dB. Thus, it can be concluded that the designed antenna has met the specifications to work as a SAR antenna.

**Keywords**: Synthethic Aperture Radar, SAR, ultra wideband, fraktal *koch snowflake*.