UNIVERSITI TEKNOLOGI MARA CAWANGAN PULAU PINANG

FLAT PINEAPPLE LEAVES FIBER MICROWAVE ABSORBER

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Agriculture waste has increased from time to time and shows no decrease in number if there are no preventions measure to curb this issue. The pineapple leaves fiber (PALF) is known as one of the common agriculture wastes. One of the PALF's features showed the properties of a good microwave absorber. Due to this matter, the main goal of the research was to fabricate flat microwave absorber by PALF as the main material. The paper is elaborated on the performance of PALF in electromagnetic waves absorption by varying the design of flat absorber. Different parameters were taken into account in this study such as comparison of different thickness affecting the reflectivity performance, comparison of the effect between the amount of the layers which are single flat layer, double flat layers and triple flat layers, followed with the comparison between the materials which are PALF, rice husk (RH) and oil palm frond (OPF) and also the comparison of impedance matching between double flat layers and triple flat layers. The chosen designs consisted of single flat layer, double flat layers and triple flat layers. Meanwhile, the size of flat absorber used throughout the study was similar to the size of commercial flat absorber. These flat absorbers were fabricated by using Computer Simulation Technology (CST) Microwave Studio program. There were 16 simulations conducted in accordance with four parameters suggested. Based on the obtained data, reflectivity performance recorded were from the range of 1 – 12 GHz. Meanwhile, double flat layers design 1 showed the best design for microwave absorber as it gave the best performance at the S band with frequency situated from 2 – 4 GHz where the maximum reflectivity is -17.54 dB and the minimum reflectivity is -10.56 dB. The overall maximum reflectivity of is -36.5 dB while the overall minimum reflectivity is -12.71 dB. This proved that double flat layer pineapple leaves fiber absorber suited to be an ideal microwave absorber.

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