CLASSIFICATION OF TREATED AND UNTREATED WATER USING ARTIFICIAL NEURAL NETWORK (ANN) BASED ON MICROWAVE NON DESTRUCTIVE TESTING (MNDT) METHOD APPROACH AT 18-26GHZ FREQUENCY RANGE

A thesis submitted in partial fulfillment of the requirement for the awards of the Bachelor Engineering (Hons.) in Electrical

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ABSTRACT

The main objective of this project is to introduce a technique to characterize treated and untreated water and developed a system that can classify these two types of water. In order to classify the water types, four stages of processes are involved. There are process of collecting water samples, measurement by using Microwave Non Destructive Testing method, finding parameter of dielectric constant and loss factor using FORTRAN software based on S11 parameters and classification process. The classification task is performed by using Artificial Neural Network (ANN) and the classification program was developed using MATLAB R2008a. The characteristic of the water samples was conducted using equipment known as Free Space Microwave Testing (FSMT) via the method of Microwave Non-Destructive Testing (NDT) at frequency 18GHz to 26GHz. Non-destructive testing is a method for determining the characteristics of materials without permanently changing its properties. There are 14 water samples was selected as a training samples for ANN .In order to see whether the developed system is successful or not another 28 samples have been tested. From the result obtained the ANN can classify all the testing samples correctly.

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