ABSTRACT

The process of identification and non-destructive imaging is needed in various industries. The method for identifying the inside of an object without doing division is tomography. One type of tomography is Induced Current Electrical Impedance Tomography (ICEIT). In principle, the ICEIT system utilizes alternating current induction with a certain frequency on a coil (coil) then generates a magnetic field around the coil. The magnetic field will interact with the object then the interaction can be observed by measuring the voltage difference at the edge of the object's edge. In this study an ICEIT system was made consisting of a series of coils and phantoms (object containers). The coil circuit consists of 9 pieces of coil with a beam-shaped wooden core. Optimal physical parameters are needed in the coil circuit so that it is feasible to identify objects. The results of the experiments carried out, the ICEIT system was able to produce different pattern of distribution of different voltage in objects with 2 conditions, namely when the object is homogeneous (laterite soil) and anomalous object (laterite soil and iron powder). All voltage difference data on the electrode pair are collected using an automatic acquisition system with a time interval between inductions of 500 ms. The most optimal physical parameters in ICEIT system coil to identify are source frequency f = 10 MHz, amplitude of 20 Vpp, range of coil inductance L = 205.4 ɥH - 221 ɥH, and magnetic field of coil B = 7.1 G - 16.5 G

Keywords: anomaly, homogeneity, identification, ICEIT system, physical parameters, voltage difference