

Characterization Study of Induced Current Electrical Impedance Tomography (ICEIT) On Iron Powder Distribution In Soil

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Identification and imaging are often used to determine the condition of a thing without destruct the thing. This is also often called the non-destructive testing. One of non-destructive testing method is Induced Current Electrical Impedance Tomography (ICEIT). The method utilizes alternating current which is flowed to the coil then induce the object to be identified or tested. The results of the induction can then be measured through electrodes around the object. The measured results are the potential boundary of each pair of electrodes, this measurement method is called adjacent in ICEIT. The use of ICEIT in everyday life is more widely used in geological industry. Previous ICEIT system research by Diah Ayu Sitoresmi, coil used in the form of 1 square coil the same size as the object under study. Weaknesses were found in previous study, some points of the object were not induced because the coil had to be moved manually so that it still faced ill posed problems. From that problem a solution emerged by trying to make 9 smaller coils sized 2 cm x 2 cm then arranged in parallel. The coil automatically alternates to induce then the potential boundary value is acquired using the adjacent method of the data acquisition tool. The ICEIT system model with 9 coils have been characterized, the most efficient time is 10 seconds, while the frequency and source amplitude are 10 MHz and 20 Vpp. After being characterized the system can distinguish homogeneous objects of laterite soil and homogeneous objects of iron powder based on position as shown in Figure 1. This research still has to be continued further so that it can be used to detect mining goods, especially the iron (Fe) in the soil

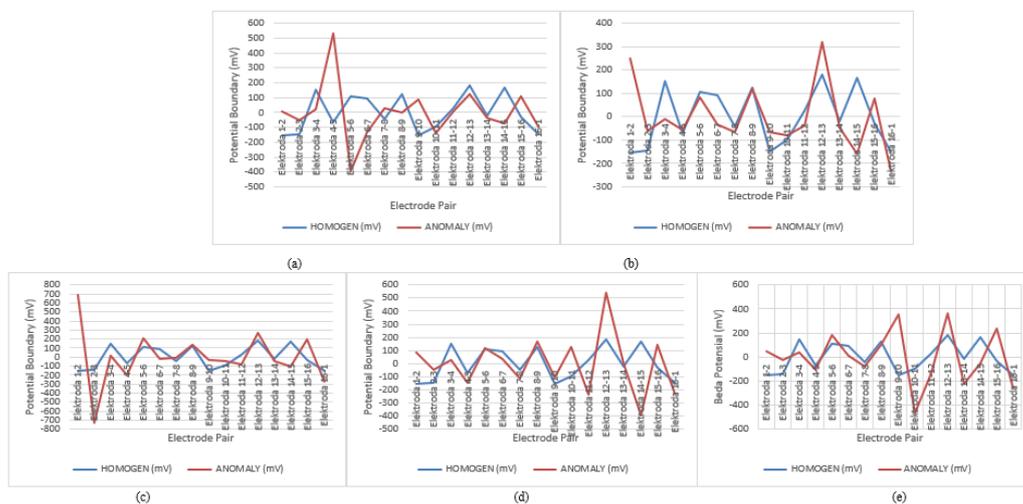


Figure 1: Potential Boundaries in homogeneous objects and anomalies in positions (a) bottom right, (b) middle, (c) bottom left, (d) top left, (e) above right

References

- [1] Sitoresmi, Diah Ayu. (2017). Studi Eksperimental Kelayakan Sistem Induksi Medan Magnet Dengan Metode Electrical Impedance Tomography. *Proceedings of Engineering*, Vol.4 (pp. 3869-3876).