

Experimental study of optimization of electrode dimension for non-invasive electrical resistance tomography application

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Abstract:

Electrical resistance tomography is used to reconstruct the image of the objects within the medium of interest based on electrical conductivity distribution. Besides, the ordinary technique of ERT applied invasive technique and causing corrosion to the electrodes because of the contact between the electrode and the conductive liquid. Therefore, the ERT system proposed in this work is to investigate the optimize dimension of the electrode in ERT using experimental approach for non-invasive measurement. In this project, four electrodes are used as transmitter and receiver. All the electrodes are arranged side by side around the pipe. In this process, only one electrode is used as a transmitter and the rest as a receiving sensor. When water is inserted in the pipe, the output of the voltage will be compressed and recorded. Nine different dimensions are investigated and it produces a different voltage output. Therefore, the appropriate electrode dimension must be determined as it also affects the conductivity of the conducting medium. In addition, the appropriate electrode dimension which is 35.34 mm (width) x 250 mm (height) was chosen as the optimize dimension from the experiment to improve the performance of the existing system.

Keywords : ERT; Electrode; Non-Invasive

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