

A Study of the Effect of Electrode Dimensions on Scaling Up ERT Applications

ABSTRACT

Electrical Tomography is a versatile and non-invasive, and robust imaging technique that is vastly applied for both industrial and medical process imaging. One of the crucial factors that influence the quality of image reconstruction is the dimension of electrodes. When implementing ERT in a real industrial setting, the scaling-up procedure from lab-scaled model, is typically based on researchers' past experiences. This work investigates the effect of varying electrode dimensions with respect to the scaled-up dimension on ERT imaging. Sensitivity analysis was done to investigate the effect of the different widths of electrodes. However, the results were found to be inconclusive, as there are insignificant differences in sensitivity magnitudes, regardless of the widths of electrodes. A comparative study for the image reconstruction obtained using different width of a 16electrodes model is used as a platform for this illustration. Results show that images reconstructed produced from the wider electrodes provides better quality in terms of colour contrast and estimation of dimension of the imaged object, using image reconstructed from lab scale model as reference.