Improvement of Electrical Impedance Imaging
for Two-Phase Flow Visualization

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Numerical and experimental works are conducted to develop a visualization technique for the phase distribution in two-phase systems by electrical impedance tomography technique, which reconstructs the resistivity distribution with the electrical responses that are determined by corresponding excitations. In conventional Newton-Raphson method, the impedance distribution, that is the phase distribution is usually reconstructed in fixed elements inside the system. In practical cases, such as the impedance imaging of two-phase flow, this model might not be useful. For the two-phase flow system, the impedance of each phase doesn't change but instead the phase boundary depends on the distribution of dispersed phase. In the present study, an new image reconstruction algorithms are developed for the detection of phase boundary. The feasibility of this method is tested for some numerical simulations and phantom experiments.