Abstract

This paper analyses the performance of grey level fitting mechanism based on Gompertz function used in Electrical Capacitance Tomography measurement system. In order to evaluate its performance, the data fitting mechanism has been applied to common image reconstruction algorithms which include; Linear Back Projection, Singular Value Decomposition, Tikhonov Regularization, Iterative Tikhonov Regularization, Landweber iteration and Projected Landweber iteration. Images were reconstructed using measured capacitance data for annular and stratified flows, and qualitative and quantitative evaluation were done on the reconstructed images in comparison with respective reference images. Results show that this grey level fitting mechanism is better in terms of improving image spatial resolution, minimizing relative image error and distribution error and maximizing correlation coefficient.

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**Index Terms**

Computer Science  
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**Keywords**

Electrical Capacitance Tomography  
Image Reconstruction Algorithms  
Data Fitting  
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