ULTRASONIC PROCESS TOMOGRAPHIC IMAGING SENSOR: AN APPROACH UTILISING TRANSCEIVERS METHOD

Abstract:

Direct analysis of the internal characteristics of process plant has become a widespread need in order to improve the design and operation of the equipment especially in liquid/gas two phase flows. The applications of tomography techniques as a robust non-invasive tool for direct analysis of the characteristics of multiphase flows have increased. One of the famous real time techniques that are usually applied was ultrasonic tomography. In this study, ultrasonic tomographic imaging sensor has been utilised to visualize the distribution of liquid/gas in a vertical column. The sensing element consists of 32 units of ultrasonic transceivers to cover the pipe cross-section. The motivation of the paper is to analyse the performance of the transceiver methods in visualising bubble hold-ups in vertical column. Some analyses have been carried out using several phantoms and the system was found excellent in visualizing the internal characteristics and provides the concentration profile for the corresponding phantoms.