



Presented at NDE2002, to predict. assure. improve. [www.nde2002.org](http://www.nde2002.org)  
National Seminar of ISNT, the Indian Society for Non Destructive Testing  
Hotel Taj Connemara and Raja Muthiah Hall, Chennai, 05. – 07. 12. 2002

## **Sizing and Characterization of Planar Defects Orientated in Different Directions Through Time-of-Flight (TOFD) and Pulse Echo Ultrasonic Techniques**

**R. Subbaratnam and M. Palaniappan**

Quality Assurance Division, Indira Gandhi Centre for Atomic Research, Kalpakkam-60102, India

### **Abstract**

The orientation of the planar defects in the weld is of prime importance for the indented service requirements of a component and need to be assessed accurately particularly for In-service Inspection (ISI) and other inspection stages. Non-destructive Examination (NDE) methods have traditionally been employed to evaluate and to establish the defect orientation. Among the NDE methods, ultrasonic examination finds a major role in assessing the orientation of the defects in a precise manner. Using pulse echo and TOFD techniques the same can be assessed. A detailed study was evolved to assess the capability of Time-of-flight Diffraction (TOFD) and Pulse Echo techniques in accurately quantifying the orientation of defects and sizing the same. Samples with different orientation notches with varying angles were prepared to assess the feasibility and accuracy of these examination methods. Pulse echo and TOFD techniques were employed to compare the results. The paper discusses the experiments carried out and the analysis of the results.