



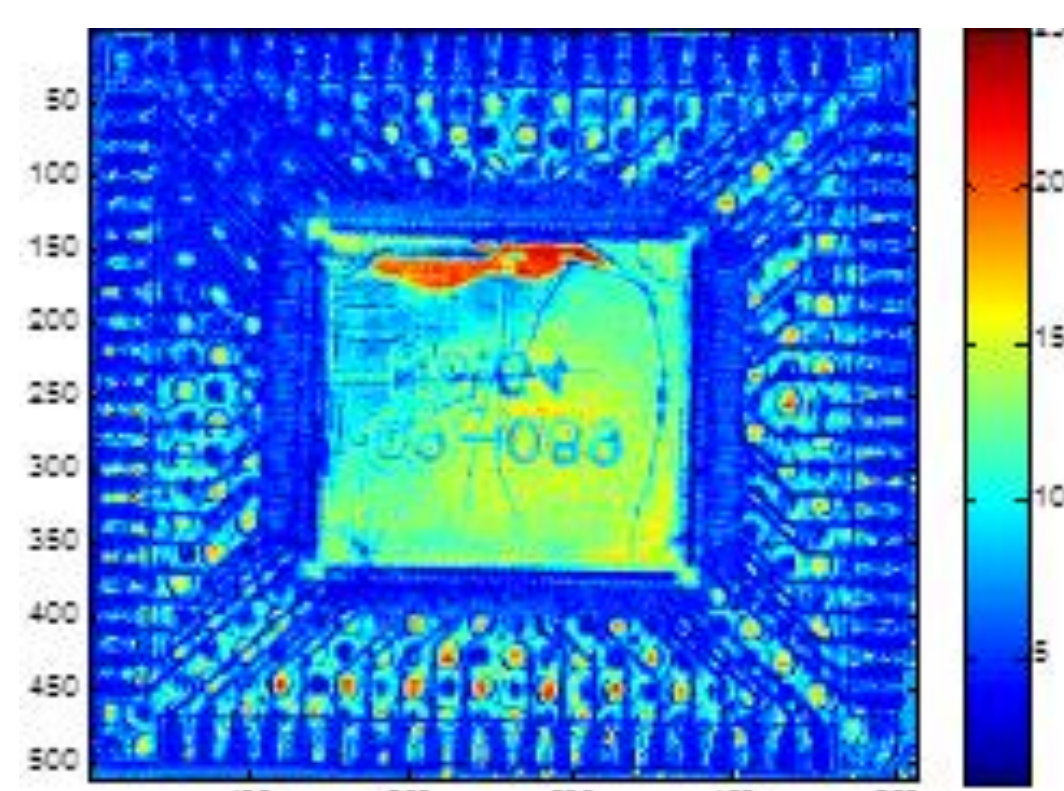
FP7 Coordination and Support Action to fund 50 technology transfer projects (TTP) in computing systems. This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 609491.

## 3DAP-TIME: 3D Acoustic Processing to Inspect Manufactured Electronics

David M. Harvey, Guang-Ming Zhang, GERI, Liverpool John Moores University, UK  
Richard Carr, Sonoscan, UK, Europe and USA

### TTP Problem

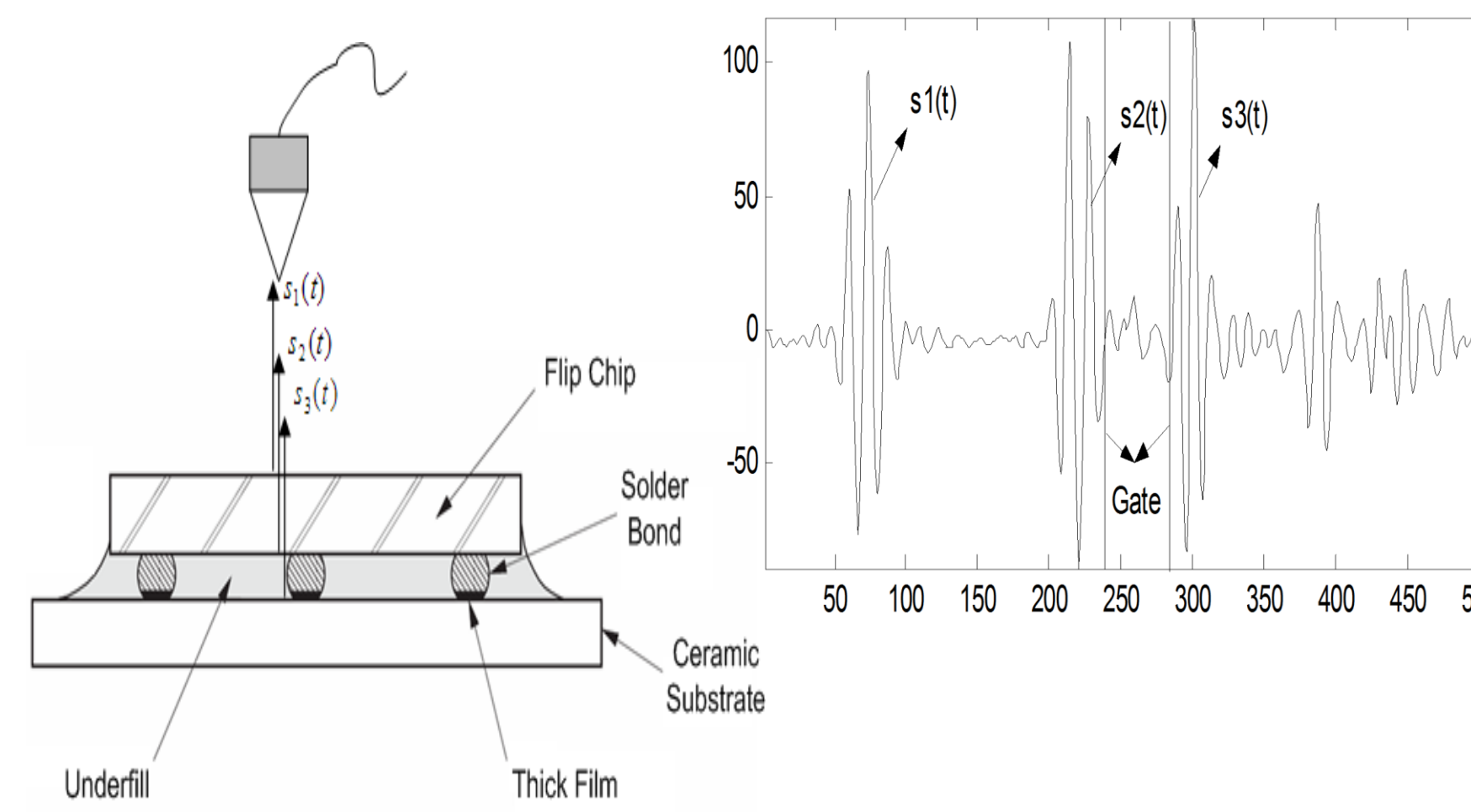
Inspection only in Two Dimensions



- Fault Detection ✓
- X-Y Position ✓
- Z-Position ?

Acoustic C-Scan or 2D Planar gauging of embedded electronic chip acquired at 230MHz

Ultrasonic Echoes from a flip-chip Under Test

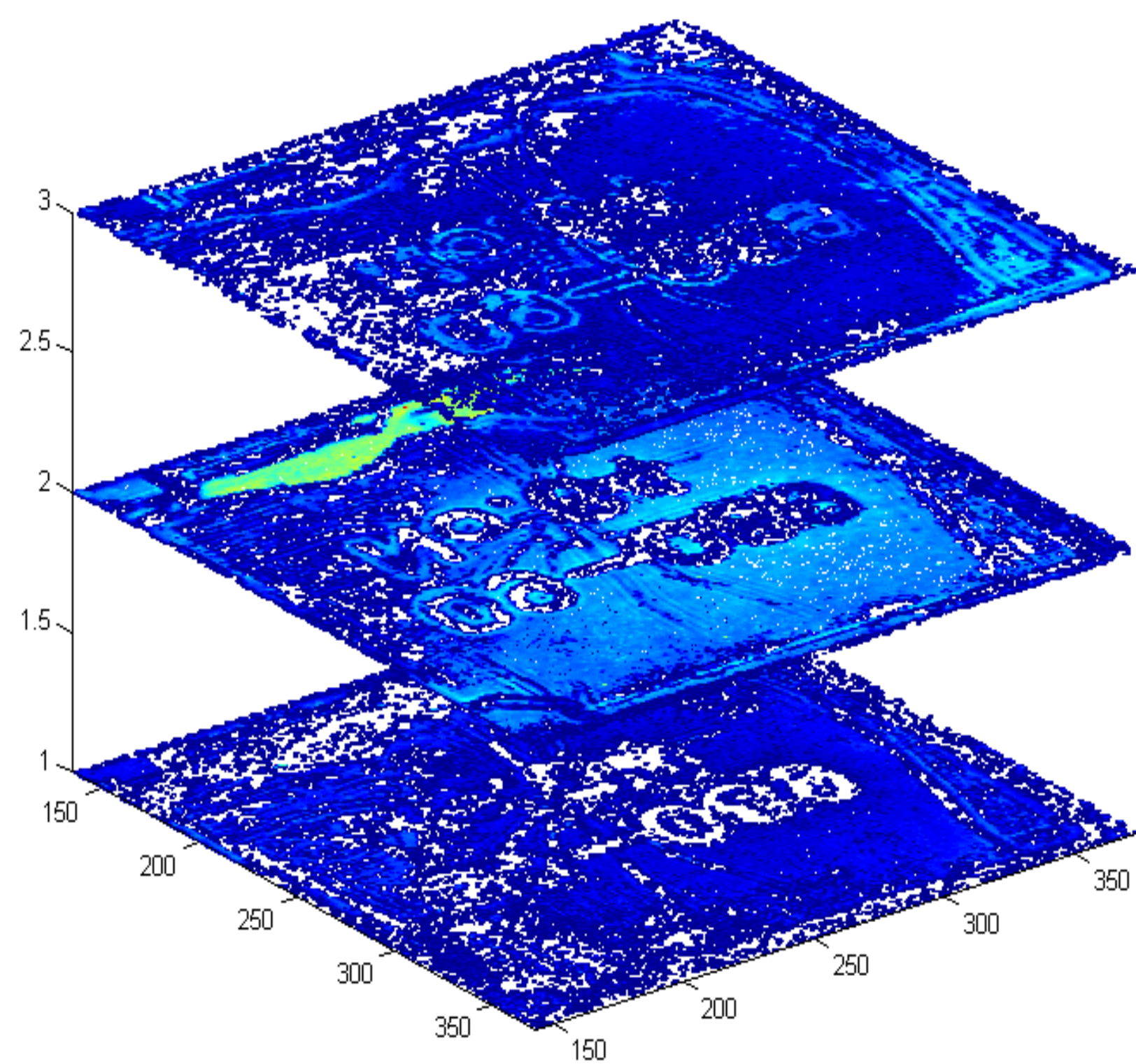


Requirements:

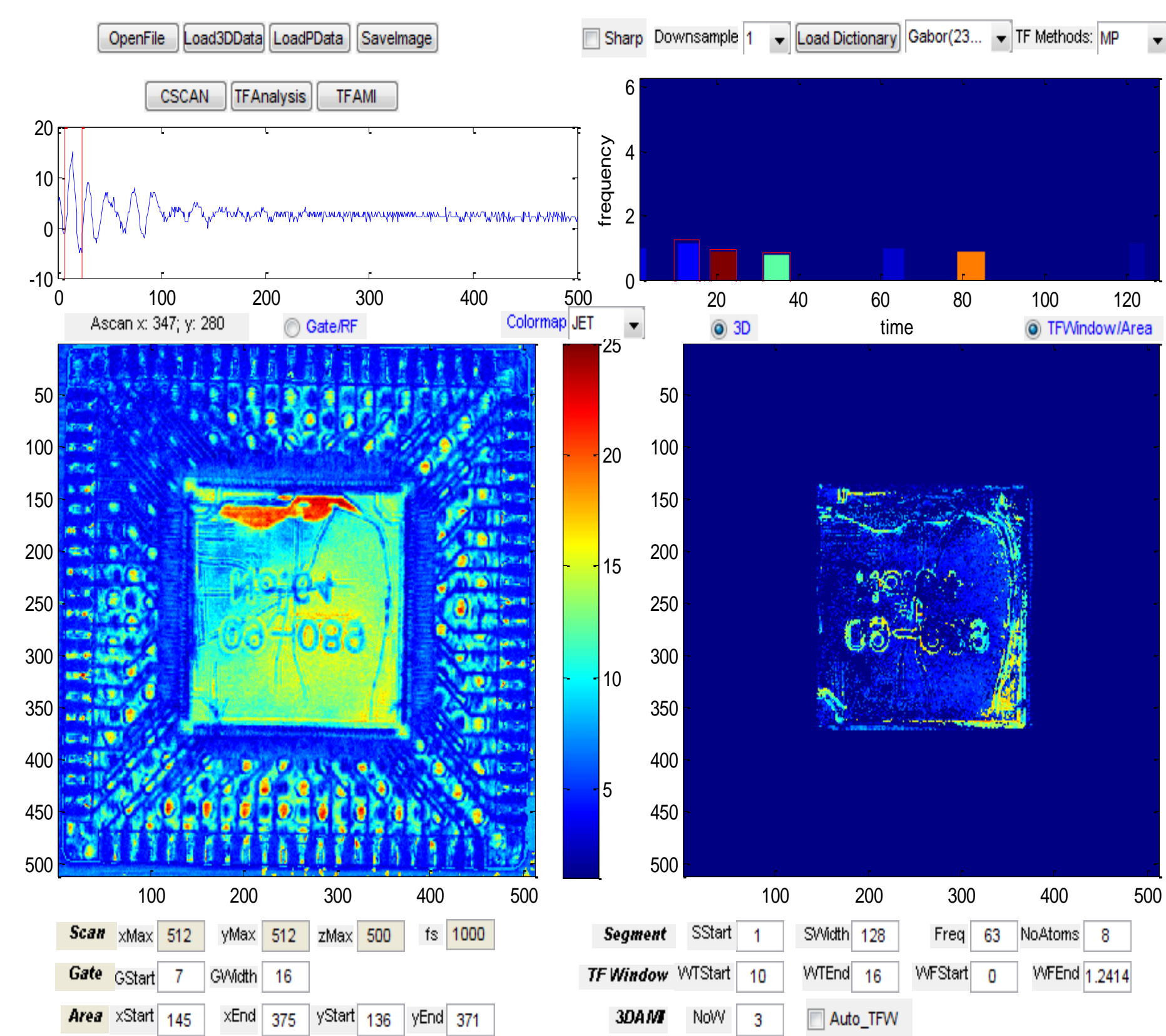
- + Echo overlaps need to be processed
- + User interface with algorithm selection and fine tuning

### TTP Solution

Separation of Individual Layers for accurate location of any delamination or fault



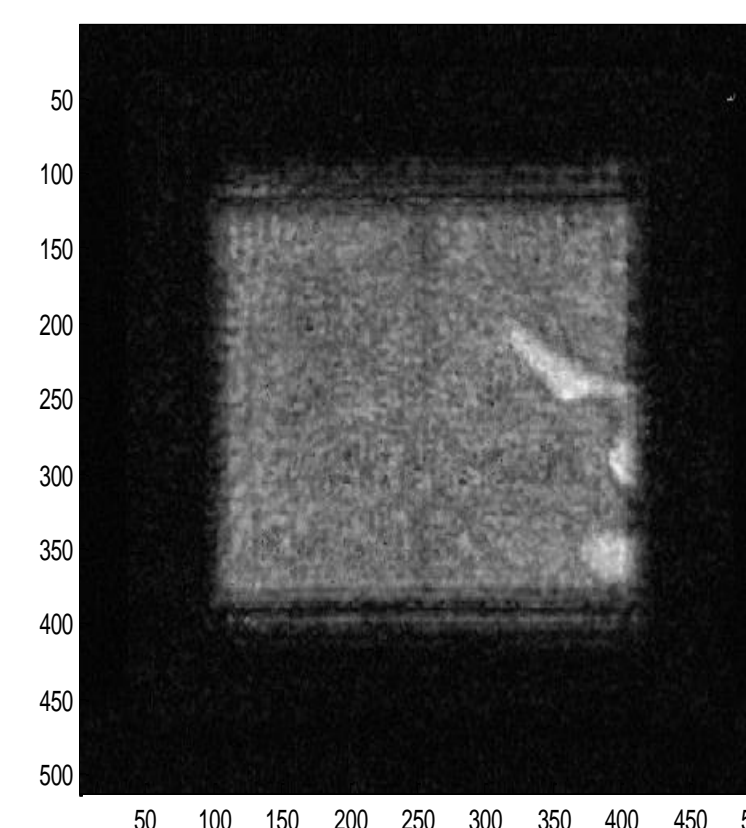
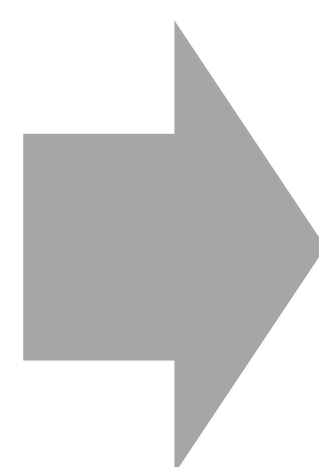
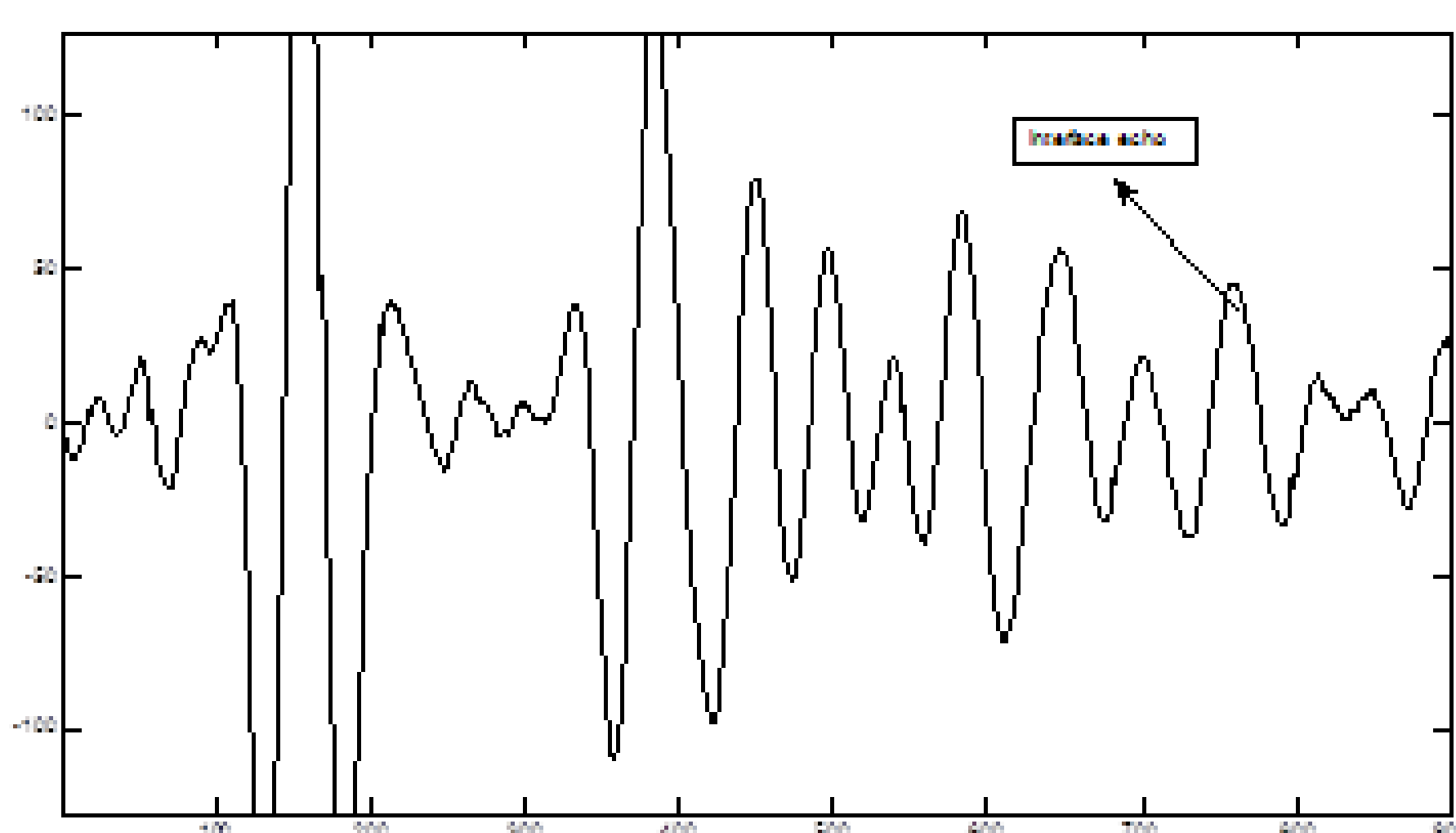
User Interface and Processing Parameter Selection



User Windows for A-scan, C-scan, Algorithm tuning and layer control

### TTP Impact

Typical Acoustic signal from a multilayered chip Acquired at 50MHz



- + Can now select signal processing algorithm for better fault detection
- + Deeper penetration at lower acoustic frequencies offers better 3D discrimination
- + Market for acoustic inspection increased. New 3D inspection methods introduced giving high accuracy at reduced frequencies

### TTP Facts

Contact: David Harvey  
E-mail: d.m.harvey@ljmu.ac.uk  
TETRA COM contribution: 32,392 EUR  
Duration: 01/09/2014-31/08/2015

