

Acoustic Microscopy of WPR18FA013

Prepared for the NTSB

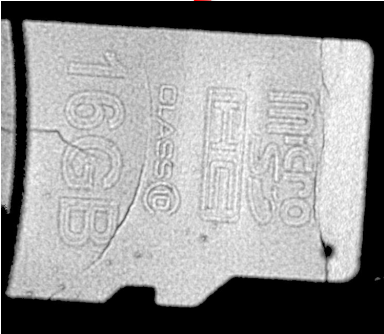
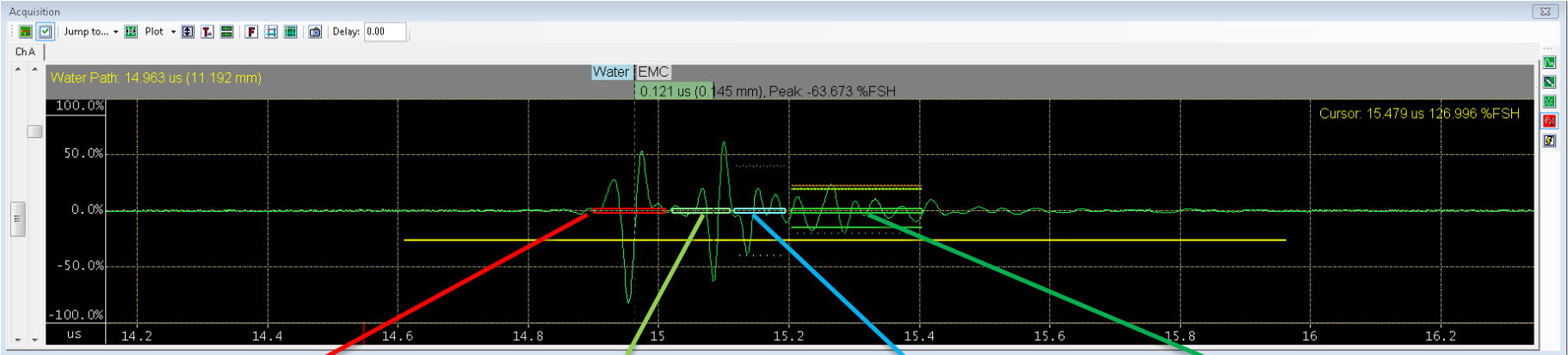
By S.R. Cain, IEEC

Binghamton University

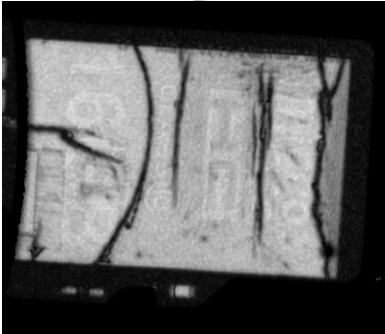
Background

- **One memory module received for analysis (incident WPR18FA013)**
- **The memory was unreadable**
- **NTSB has performed X-ray analysis and suspects that the chip is cracked**
- **Analysis**
 - Sonix HS500 acoustic microscope
 - 50 MHz transducer focused to 14.95 usec
 - Pulse echo mode, gates set on the surface, chip and laminate layers
- **Results – confirmed chip crack**

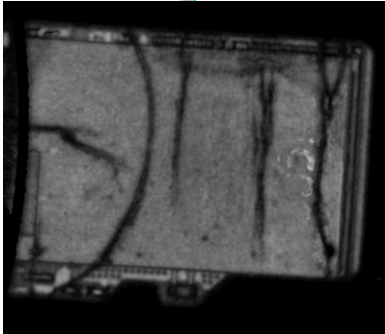
Gate Settings



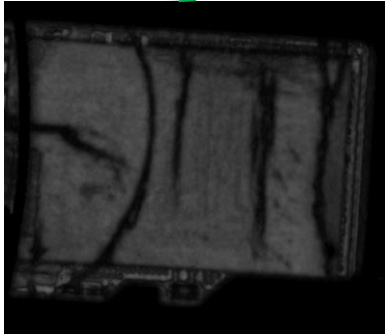
Surface



Top of the Chip

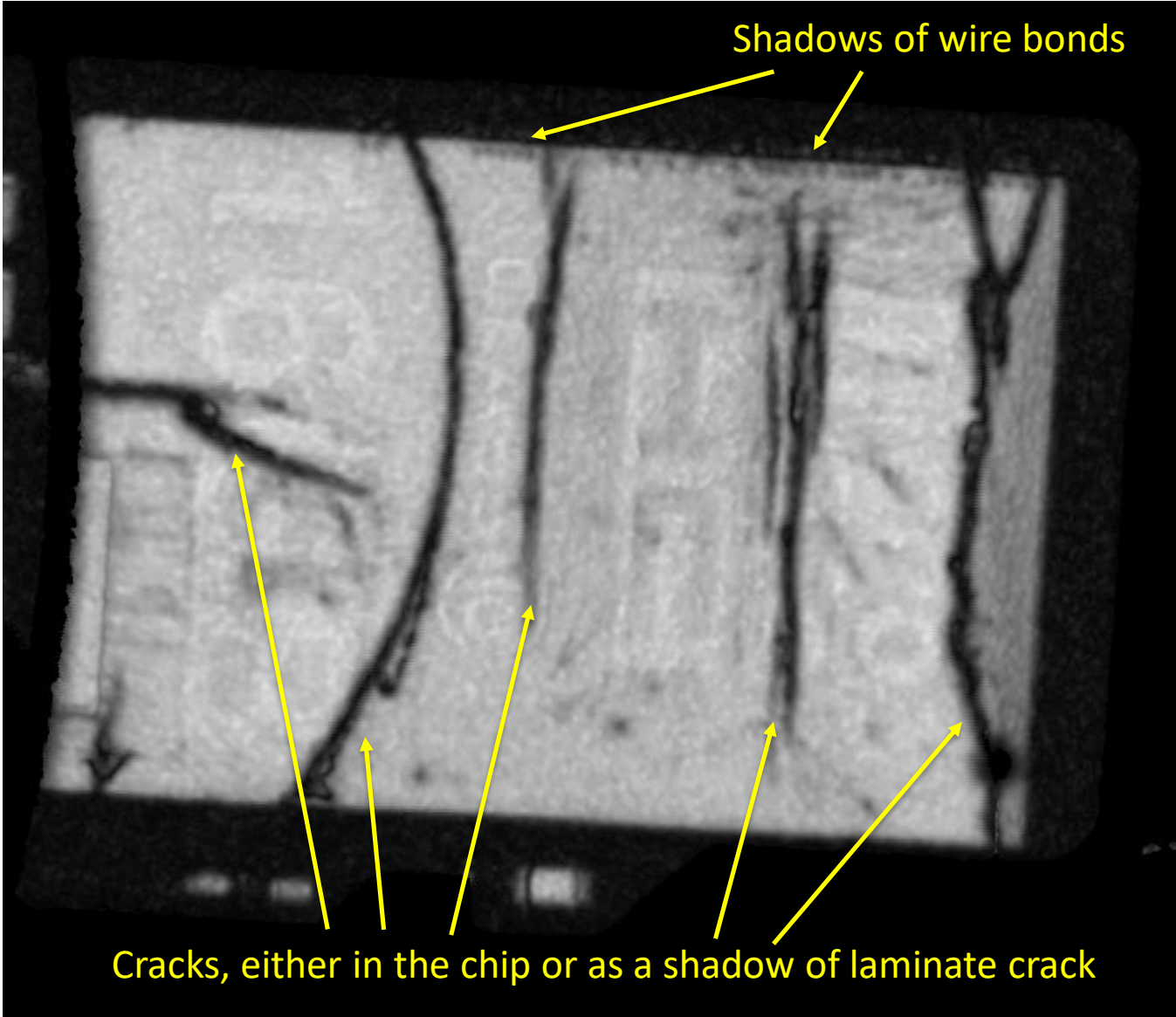


Laminate Surface with Chip Shadow



Bottom of Laminate Circuitry with Chip Shadow

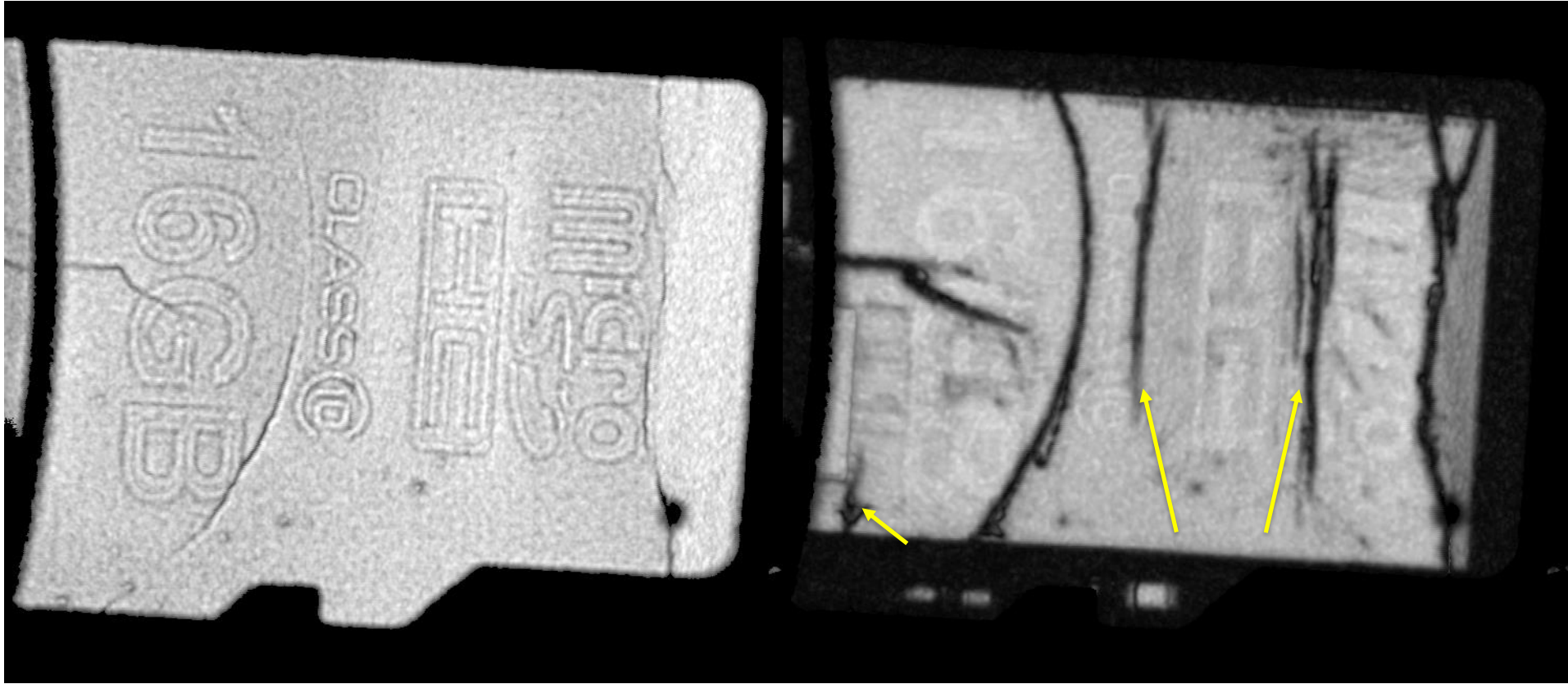
Interpretation of Image of Chip



Comparison of Surface and Chip Images

Surface

Top of the Chip



The highlighted cracks in the chip image do not appear in the surface image, indicating that the damage is below the surface – conclude that the chip is cracked