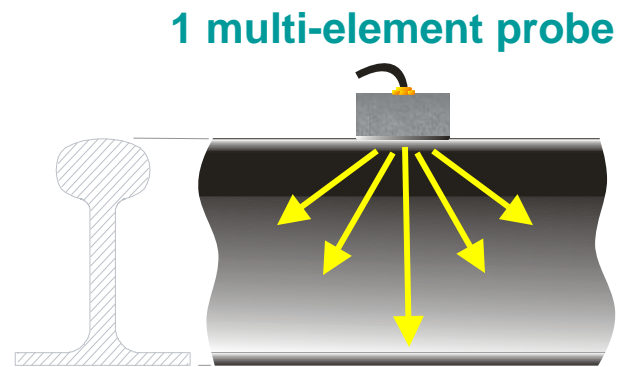


Conventional Phased Array Technique

Multiplexed system

Testing speed : 20km/h

Defects detected : -70° -35° 0° $+35^{\circ}$ $+70^{\circ}$

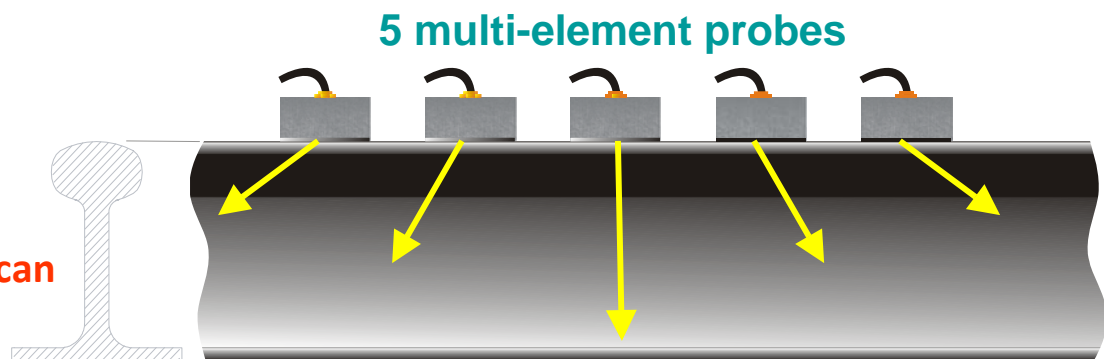


Parallel system

Speed testing : 100km/h

Defects detected :
 -70° -35° 0° $+35^{\circ}$ $+70^{\circ}$

Testing speed decreases if we want to scan
around these main angles.



FAAST II

FAAST II TECHNIQUE

Testing speed : 100km/h

Defects detected :

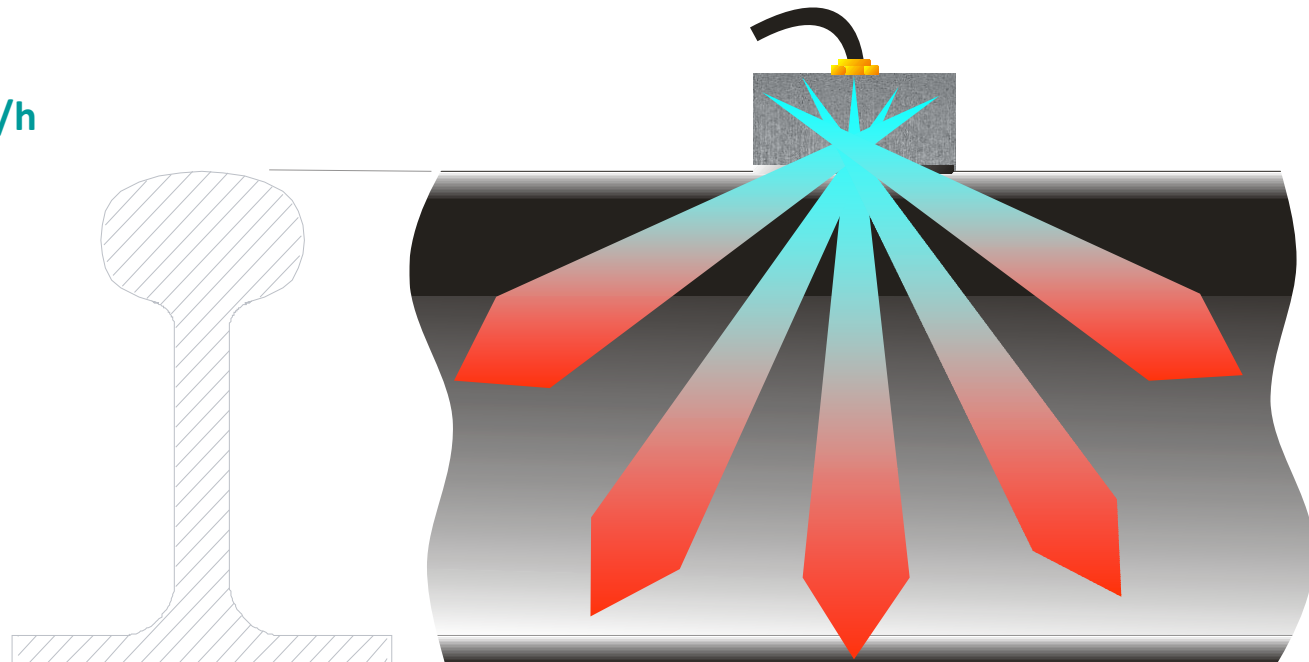
FBH from - 75° to - 60°

FBH from - 45° to - 30°

FBH from - 10° to +10°

FBH from +30° to +45°

FBH from +60° to +75°



Example: TUBE/PIPE

Description

In-line tube inspection at very high speed

Detection and characterization of longitudinal, Transversal and oblique defects from over 360°

Use of only one 2D MATRIX ARRAY probe for ROTATING TUBE TECHNIQUE

Or 2D SURROUNDING ARRAY probes for LINEAR FEEDING TUBE TECHNIQUE



PATENTED

Fast Automated Angle Scan Technique

HIGH SPEED ULTRASONIC TESTING WITH 2D MATRIX ARRAY



- Omnidirectional testing with each pulse
- Real time gate monitoring : amplitude, distance and angle



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FAAST II
FAST AUTOMATED ANGLE SCAN TECHNIQUE

FAAST Linear Pulser

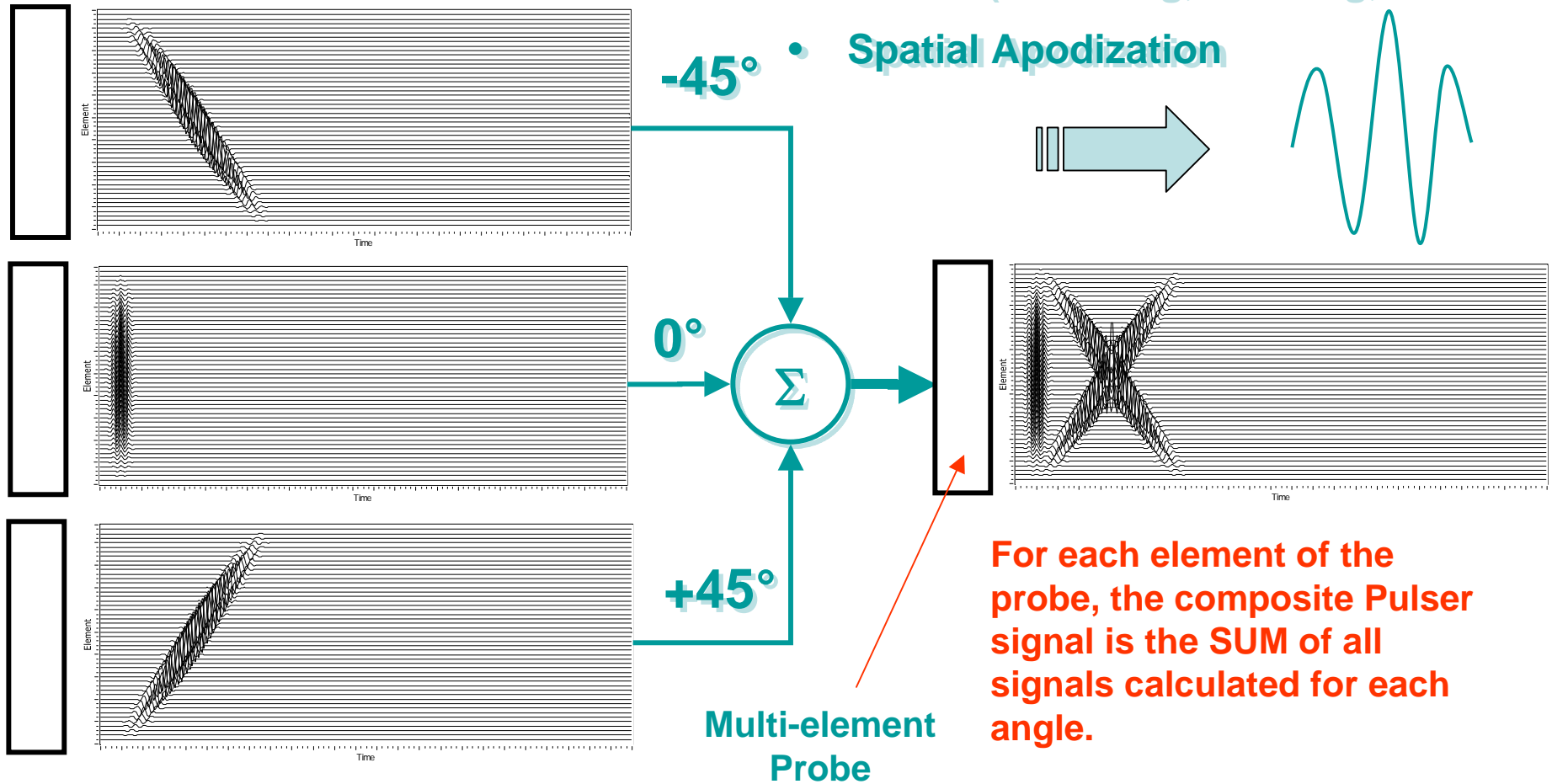
Patent WO 03029808

FAAST II

Linear Pulser Signal Calculation

Settings fully independent per Angle:

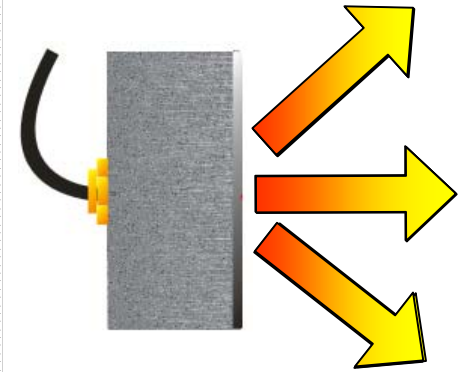
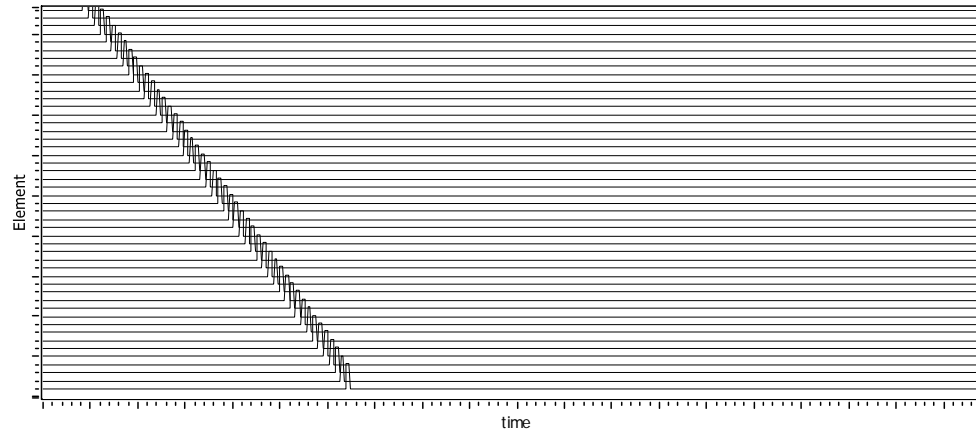
- Frequency, Amplitude, Cycles
- Filters (Hamming, Hanning, etc...)
- Spatial Apodization



FAAST II

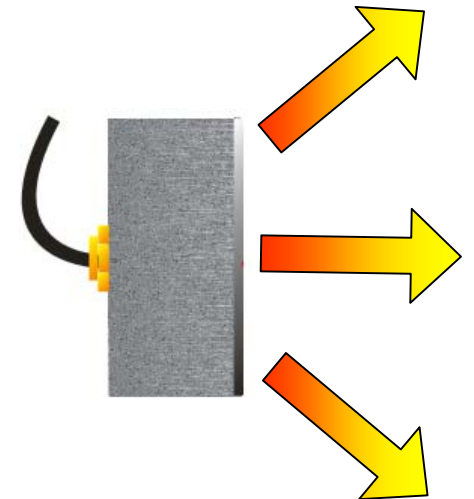
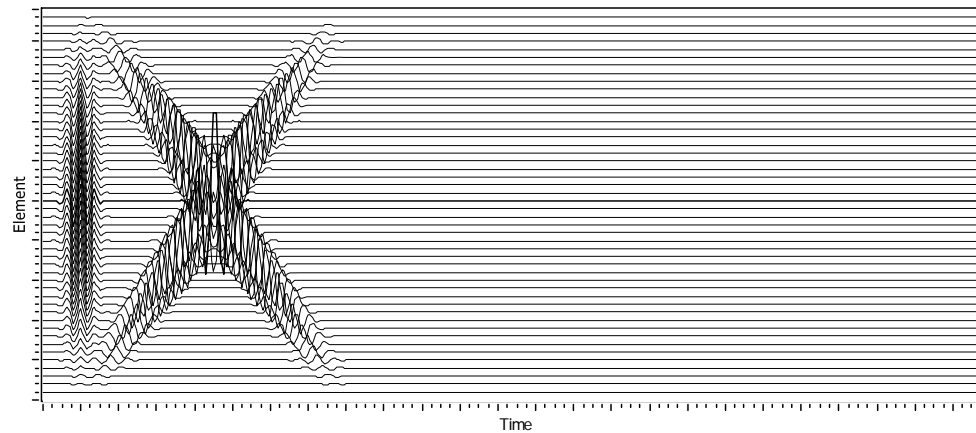
One shot = One angle

Conventional
Phased Array
Square wave pulser



One shot = Multiple angles

FAAST II
Linear pulser





FAAST II

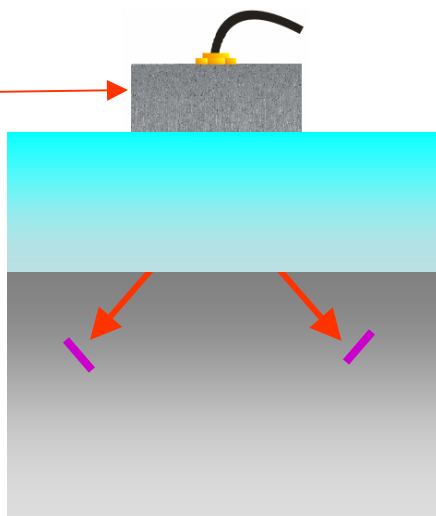
FAAST II Data Process

Patent WO 2004074864

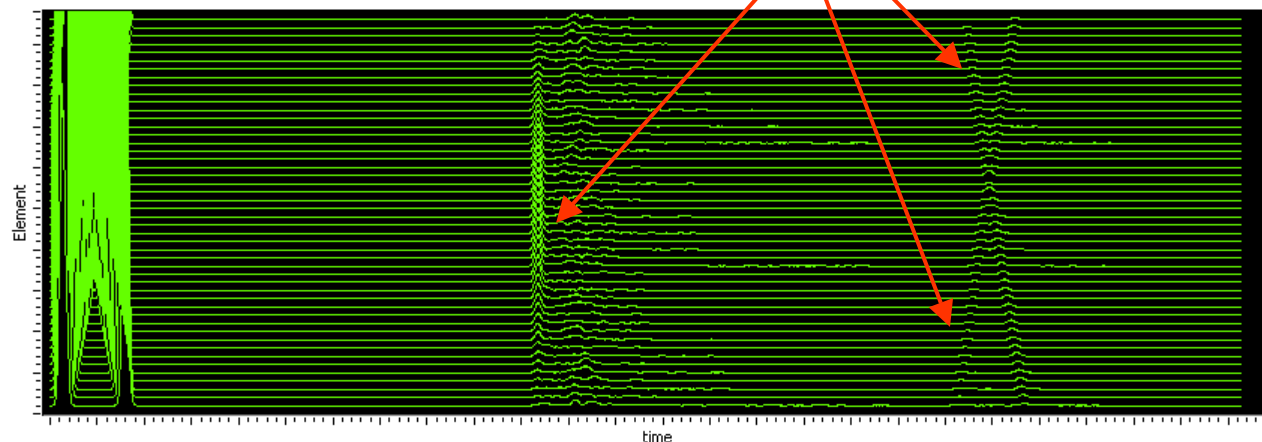
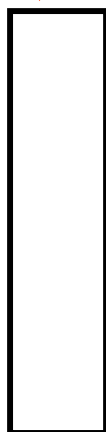
FAAST II

DATA ACQUISITION

Multi-element Probe



Elementary A-Scan
per element



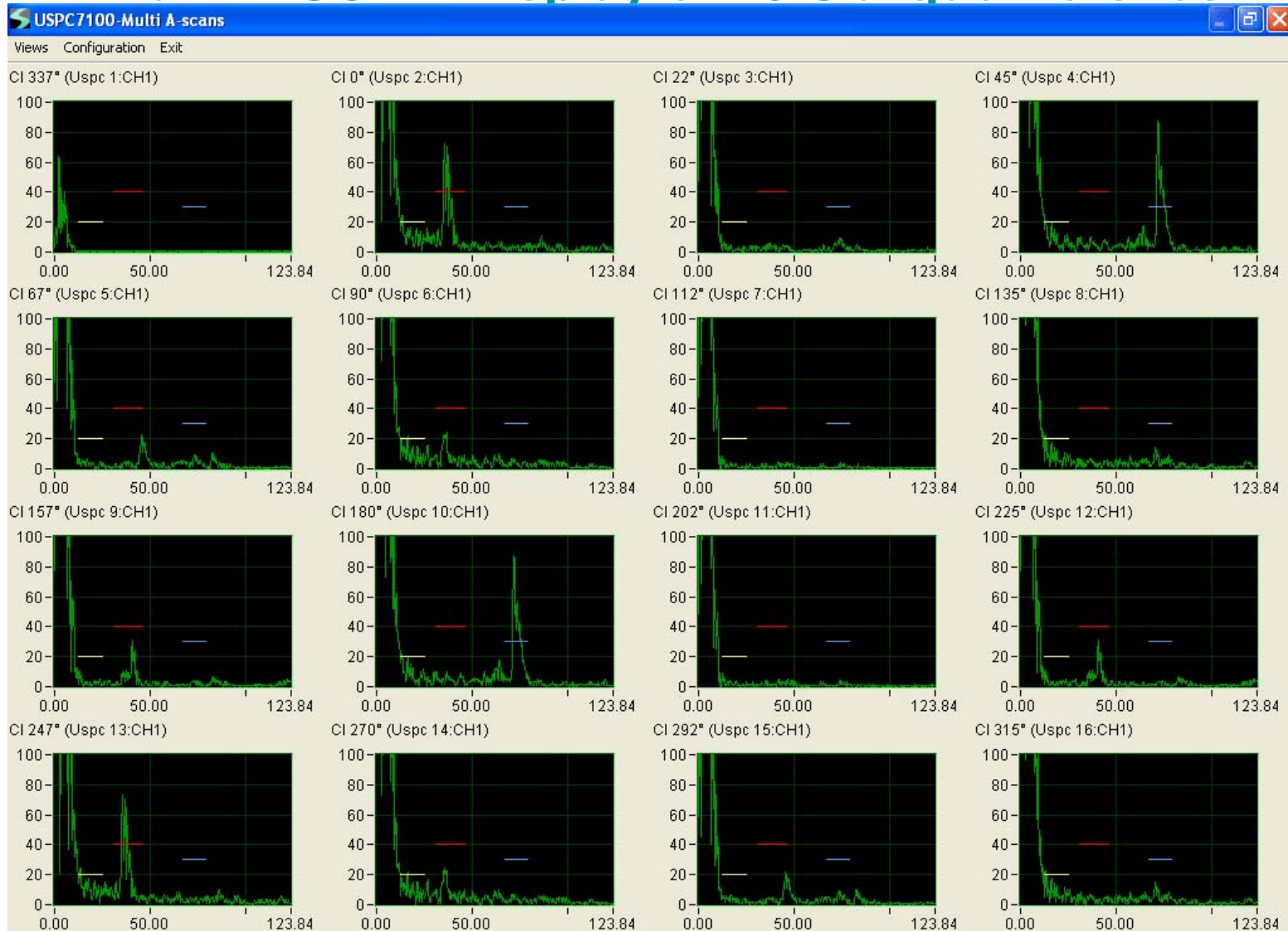
Three responses
from the single shot

RAW DATA: FULL ACOUSTIC FIELD REPRESENTATION IN RECEPTION



FAAST II

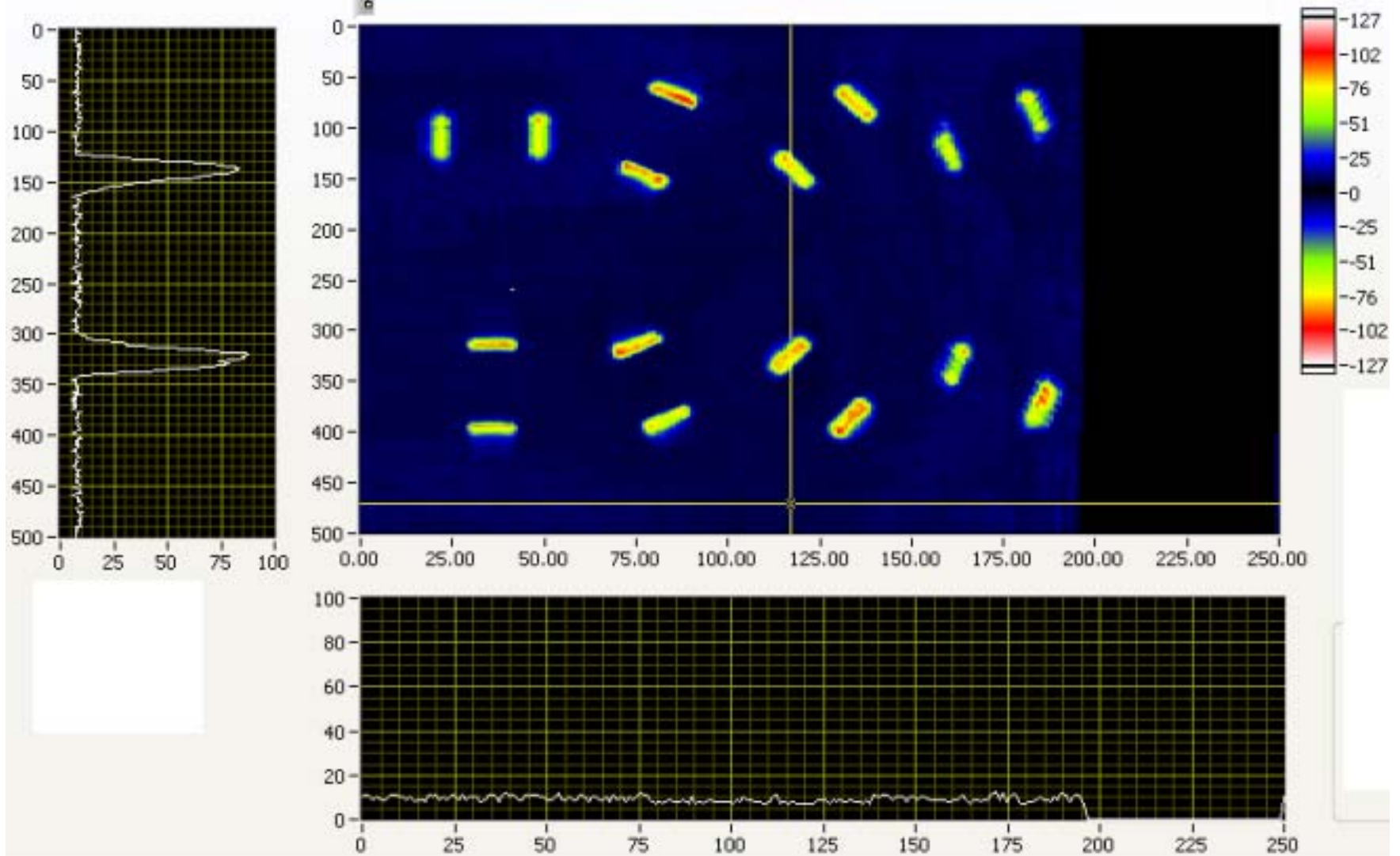
Multi A-SCAN Display of 16 Oblique Notches



**One A-Scan Acquisition & Display every 22.5° Reflector over the 360°
for Conventional Gate Monitoring.**

FAAST II

C-SCAN MAPPING REPRESENTATION OF 16 NOTCHES EVERY 22.5° IN TUBE



C-Scan of Peak Amplitude



FAAST II

FAST AUTOMATED ANGLE SCAN TECHNIQUE

Phased Array System for Very High Speed in-line Ultrasonic testing:

- **Rail on track at 100 km/h Speed with 1D LINEAR Probe**
 - **Tube/Pipe Longitudinal, Transversal and Oblique Flaws every 5° over the 360° at 2.5 m/sec Circumferential Speed with 2D MATRIX Array Probes**
 - **High Precision Tube Longitudinal & Transversal Flaws at 24 m/mn Linear Speed with 2D SURROUNDING Array Probes**
-



FAAST II

64 channel

Industrial PC Racks

MAIN FEATURES

- PATENTED PHASED ARRAY TECHNC FAAST II
- FULL PARALLEL SYSTEM
- UP TO 2 048 CHANNELS
- MULTI-BEAM TRANSMISSION **IN ONE SINGLE SHOT** VIA MULTI-ELEMENT PROBES
- REAL TIME DATA PROCESSING AND MULTI-ASCAN DISPLAY
- LINEAR & SECTORIAL SCANNING WITH SINGLE OR MULTIPLE BEAMS
- COMPATIBLE WITH ALL TYPES OF MULTI-ELEMENT PROBES: 1D LINEAR, 2D MATRIX, 2D CIRCULAR, 2D SURROUNDING, ...
- COMPATIBLE WITH **ACTIVE PROBES** EMBEDDING ELECTRONICS: PULSERS, PREAMPS, MULTIPLEXERS.



Conclusion

1. **FAAST II IS A UT PHASED ARRAY SYSTEM ESPECIALLY DESIGNED FOR HIGH SPEED PRODUCTION LINES AND ABLE TO REPLACE MORE THAN 10 CONVENTIONAL PHASED ARRAY SYSTEMS IN PARALLEL.**

2. **FAAST II USES MULTI ELEMENT ACTIVE PROBES WITH EMBEDDED ELECTRONICS SUCH AS PULSERS, PREAMP AND MULTIPLEXER**
 - **ALLOWING THE LIMITATION OF CONNECTORS WHEN USING A HUGE NUMBER OF ELEMENTS. EXEMPLE WITH A 2D MATRIX PROBE 128x8 ELEMENTS AND WITH ONLY 64 CONNECTORS.**

 - **SOLVING IMPEDENCE ADAPTATION ISSUES WITH 2D MATRIX PROBES**