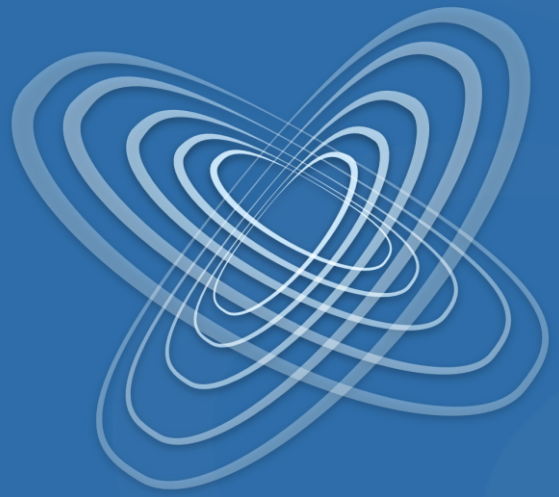


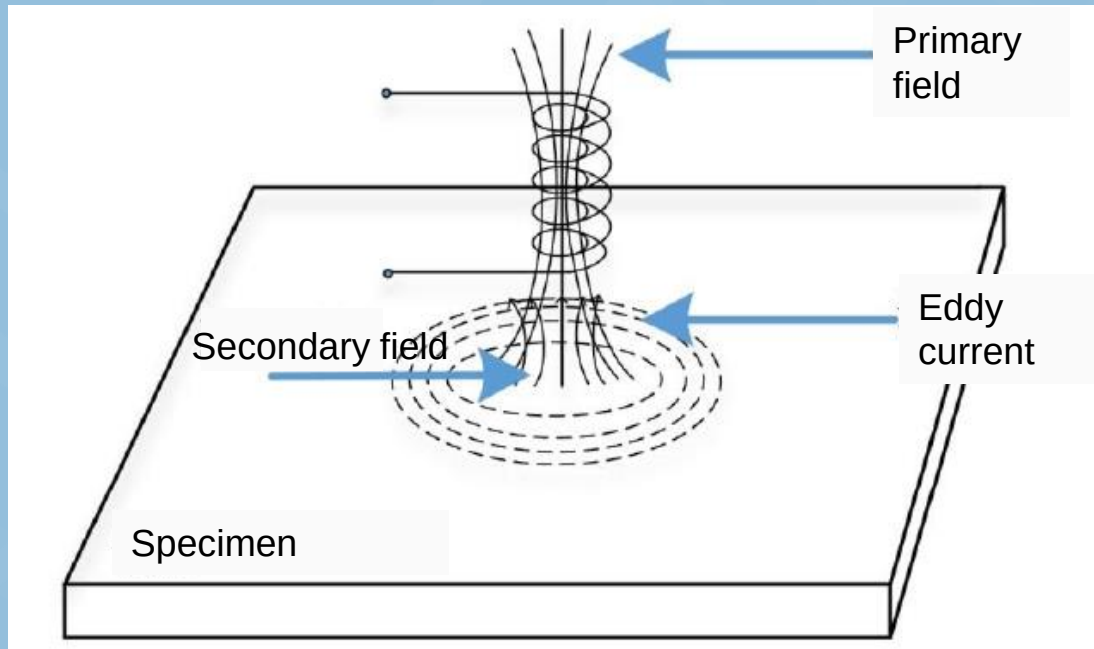
ACCUSPECT

Intelligent Multi-frequency Portable Eddy Current Non-destructive Detector

ACCUSPECT
Background

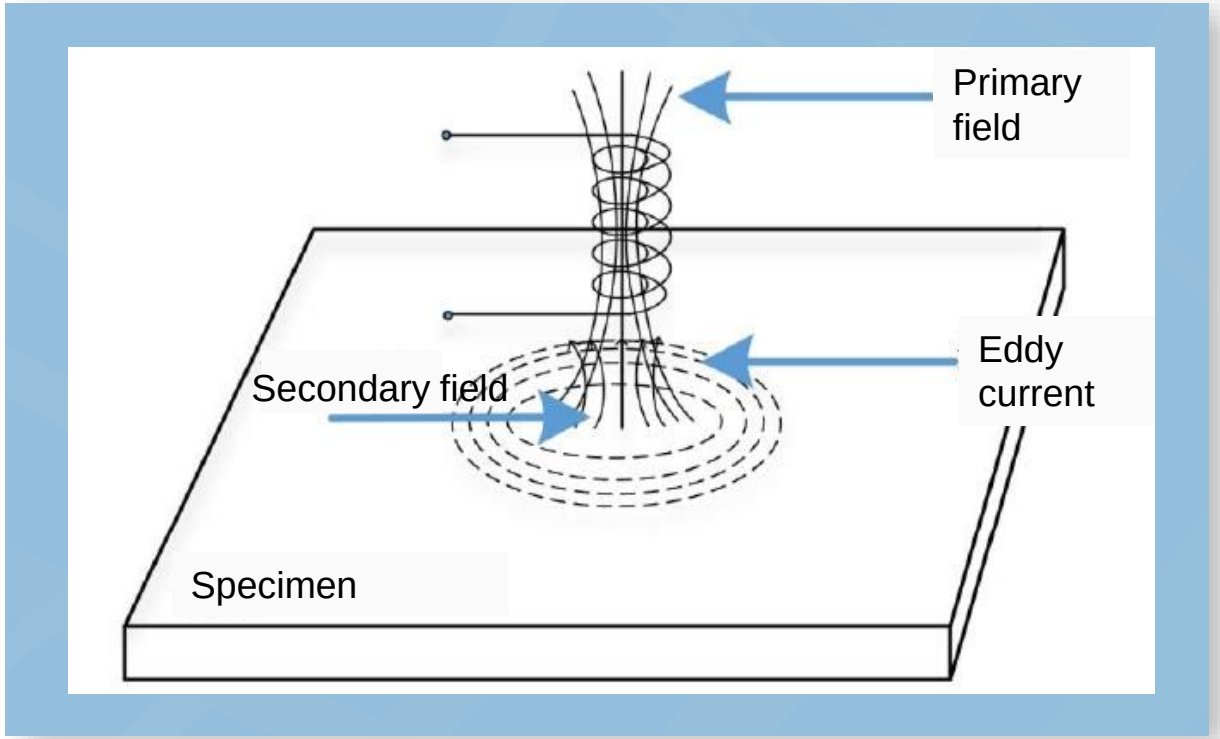
Eddy current testing is one of the most widely used non-destructive testing techniques in industrial applications. An alternating current is injected into a coil to generate a corresponding alternating magnetic field, which is called the primary magnetic field. For a specimen made of a conductive material, eddy currents are induced in the specimen .

The eddy currents in the specimen will induce a magnetic field, called the secondary magnetic field, which opposes the primary magnetic field and reduces the magnetic flux existing in the coil, resulting in a change in coil impedance.



ACCUSPECT
Background

When the sensor scans across the defect, the eddy current will be disturbed due to the discontinuity of the conductivity caused by the defect. Therefore, the secondary magnetic field induced by the eddy current field changes. Besides, since the excitation frequency and the injecting current keep the same, the primary magnetic field remains unchanged. Hence there is a change in the coil impedance due to the presence of the defect, which is manifested as a change in the amplitude and phase of the detection signal in the detection impedance diagram.



ACCUSPECT
Applications

Eddy current testing is one of the most used non-destructive testing techniques in industrial applications and is widely used in aerospace, railway system, pipeline testing and other fields.

ACCUSPECT
Advantages

Real-time detection

Automatic identification, imaging, and qualitative analysis of defects can be performed in real time and in-situ, avoiding the tedious and time-consuming steps of bringing samples back to the laboratory for inspection.

Strong adaptability to samples

The tested sample does not require additional surface polishing, cleaning, and leveling treatment; both cylindrical and flat samples can be measured.

Adaptability to test environment

With fast test speed and high detection accuracy, the built-in algorithm can minimize the external environment and electromagnetic interference , suitable for the complex and diverse test environment of the power plant.

Wide range of testing applications

We can design multi-channel or array probes for large-area scanning for different application scenarios, effectively improving detection efficiency.

High degree of equipment intelligence

The user interface of the equipment can be flexibly customized, and the operation is simple, and the evaluation results can be obtained automatically and quickly based on the measurement data

ACCUSPECT
Product introduction

ACCUSPECT - The intelligent multi-frequency eddy current flaw detector adopts the most advanced FPGA and DSP digital processing technology to realize real-time multi-frequency eddy current detection, which can effectively detect defects in metal materials. Its accuracy and speed exceed the existing mainstream products. ACCUSPECT can preset parameters and expert programs according to user needs. It is easy to operate, with an intuitive man-machine dialogue interface and touch screen.

ACCUSPECT
Product function information

- High definition, high resolution touch IPS display screen
- Easy to operate, support both Chinese and English operation interface
- Multiple intelligent automatic detection and alarm methods
- Multi-frequency multi-channel eddy current testing
- Fast and high precision electronic balance
- The probe excitation amplitude can be adjusted
- Multi-track impedance plane and time-base scan display
- Built-in high-performance solid-state lithium battery (can work continuously for 5+ hours)
- Interface: USB interface and network interface
- Probes can be customized
- Dedicated process parameters can be preset
- Real-time data storage and database management
- Unique crack analysis function

ACCUSPECT
Product parameters

Size and weight

- Size： 302×209× 133cm
- Weight： 2.7 kg
- Battery： External adapter (DC 18V) built-in lithium battery (14.8V, 6.3AH)

Working environment

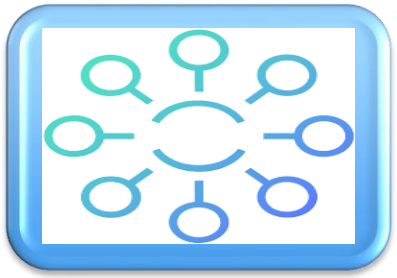
- Working temperature： -20℃-+55 ℃
- Storage temperature： -20 ℃ -+50 ℃
- Relative humidity: no more than 85%

Eddy current testing

- Channel： 1 up to 8
- Frequency： 1k-100k
- Mixing unit: digital, adjustable
- Gain: minimum step size of 0.1dB
- Phase rotation, 0.001 degree
- High pass filter, adjustable
- Low pass filter, adjustable
- Digital filter points, max 1M
- Test data storage, up to the maximum hard disk capacity
- Display: 10.1 inch, 2560*1920 high resolution TFT touch LCD screen, tempered glass protection
- Microprocessor: 32 bits
- Storage: Solid State Drive
- Memory capacity: 32G

ACCUSPECT
Advantages

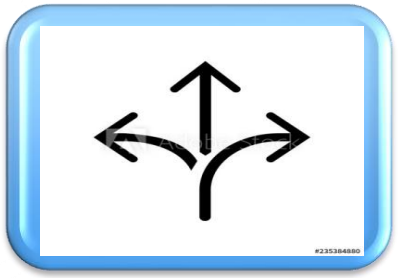
High speed:
Data speed up to 10,000 frames per second



Multi-channel:
1-8 channels

High precision:
The detection rate of defects above 2mm is as high as 95%

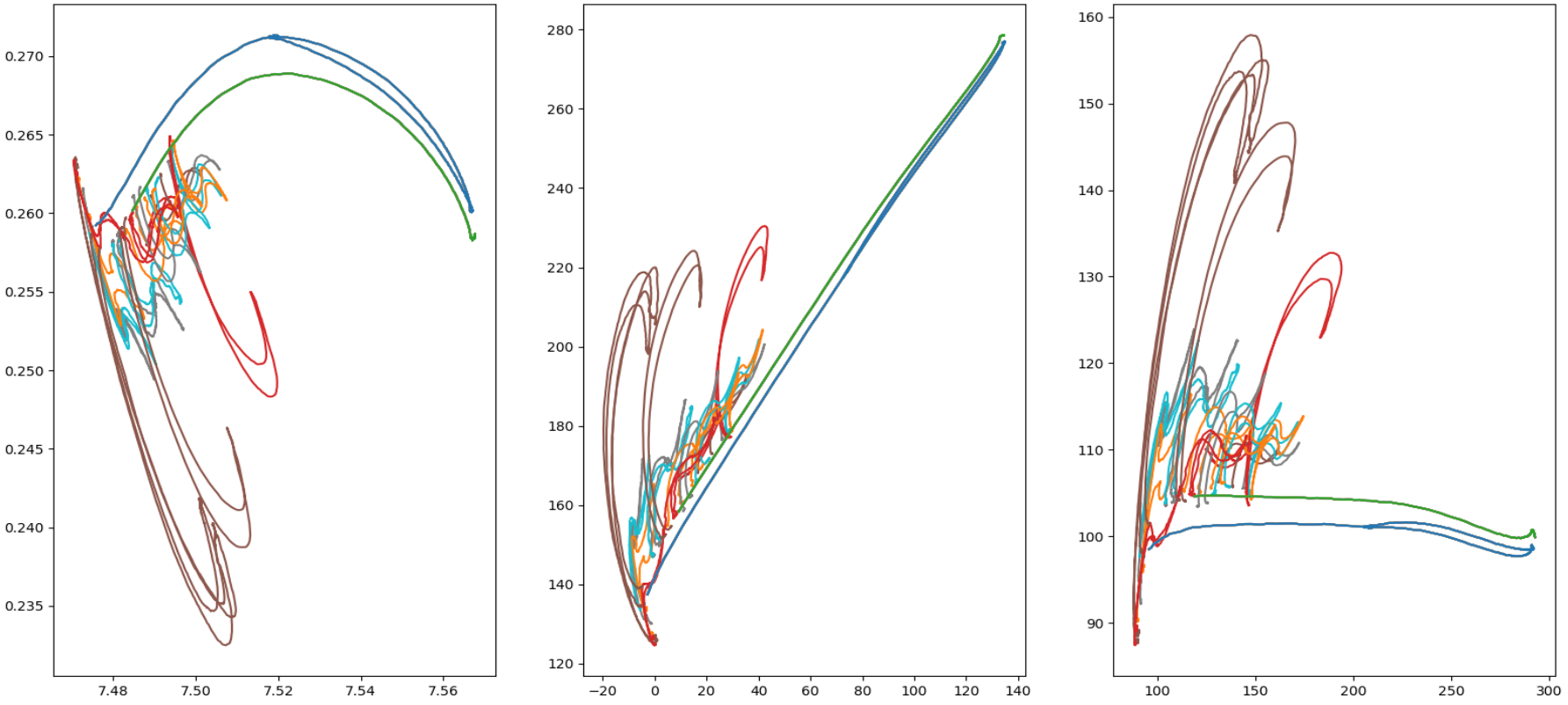
Adjustable sensor:
Sensor can be extended to reach difficult to access positions or harsh environment



Strong scalability:
Channels, storage capacity, frequency range, etc. can be customized and adjusted

ACCUSPECT
Unique defect extraction algorithm

Defect signal and lift-off signal separation

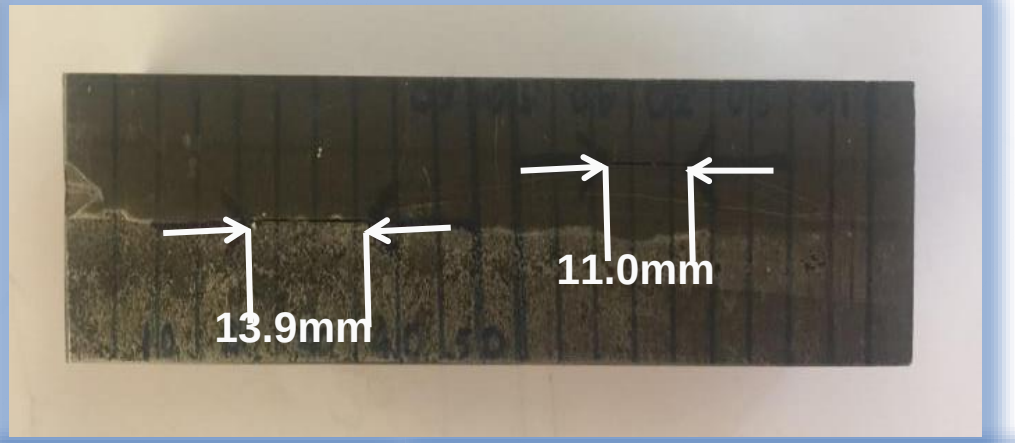


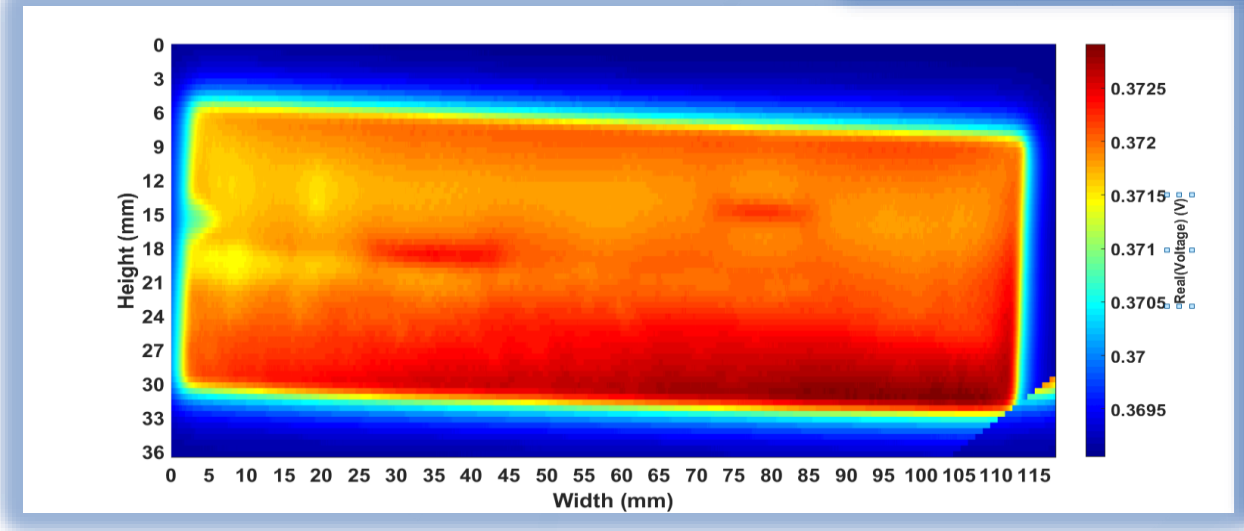
ACCUSPECT
Typical product application scenarios

ACCUSPECT Intelligent multi-frequency eddy current detector, which can be used for in-service and pre-service inspection in aviation, aerospace, rail transit, electric power and petrochemical fields

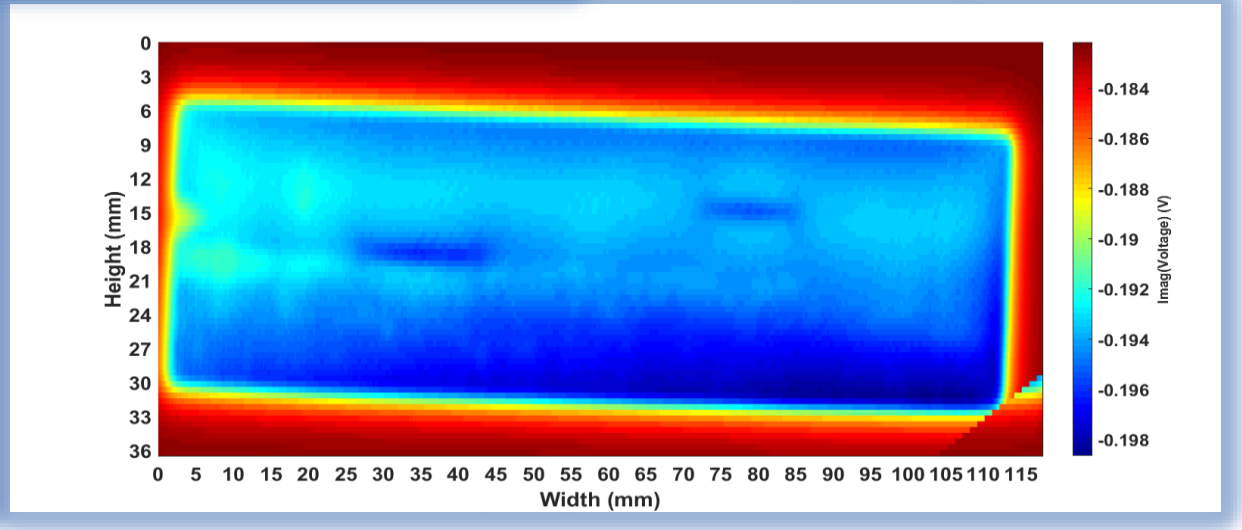
- ✓ General defect assessment
- ✓ Without removing the fasteners of rivet holes or bolt holes, it can detect cracks in the holes
- ✓ Surface crack detection for metal parts and ferromagnetic welds
- ✓ Quality detection of various non-ferromagnetic pipelines such as copper, titanium and aluminum in service, i.e. cracks and corrosion.

ACCUSPECT
Defect detection imaging



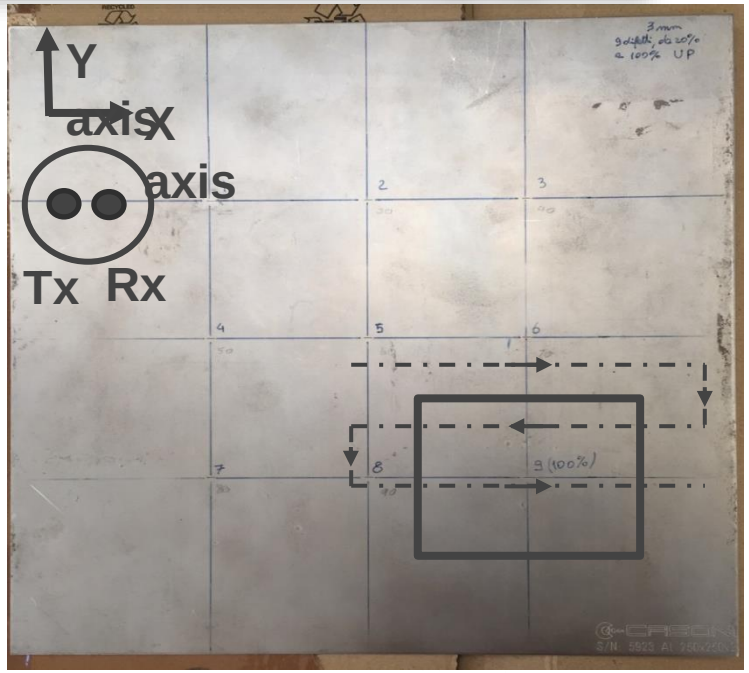


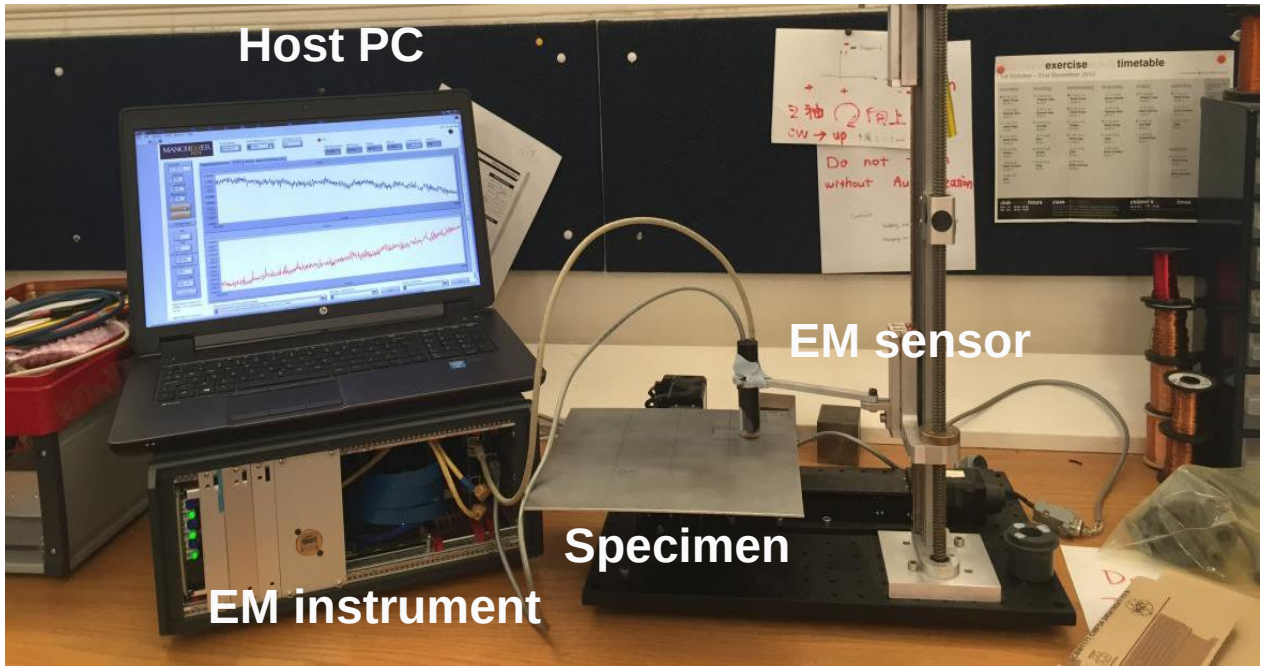
Real part



Imaginary part

ACCUSPECT
Defect detection imaging





(a) The metal plate has 9 defects with different depths, and the defect depth ranges from 20%-100% of the thickness of the metal plate

(b) Experimental setup includes host PC, EM instrument, EM sensor and specimen,

The length of the defect along the X axis is 3mm.

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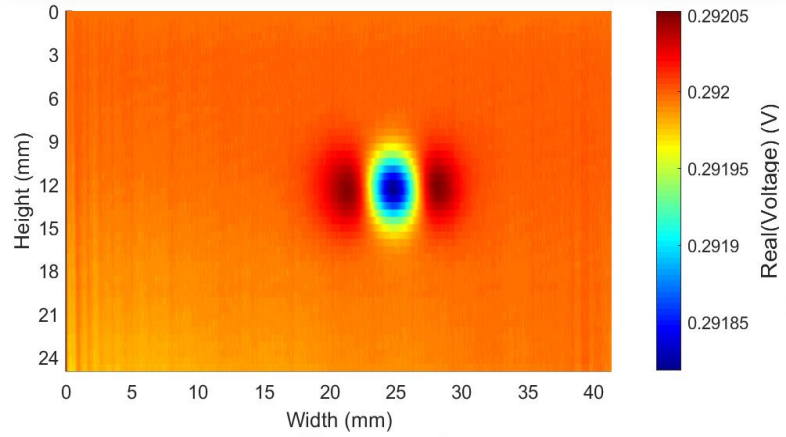
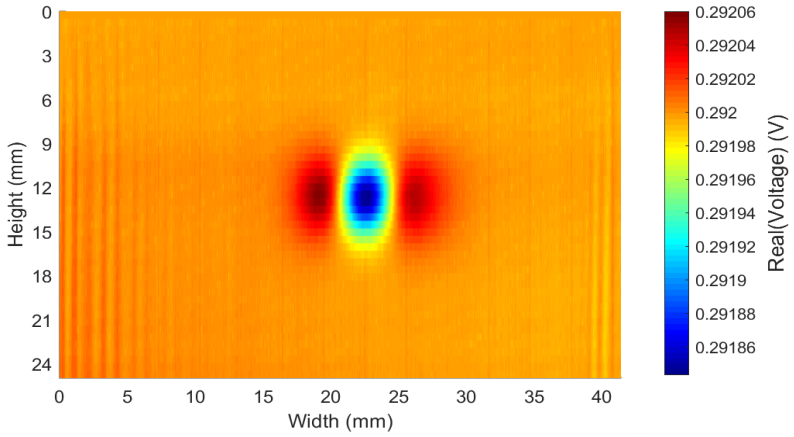
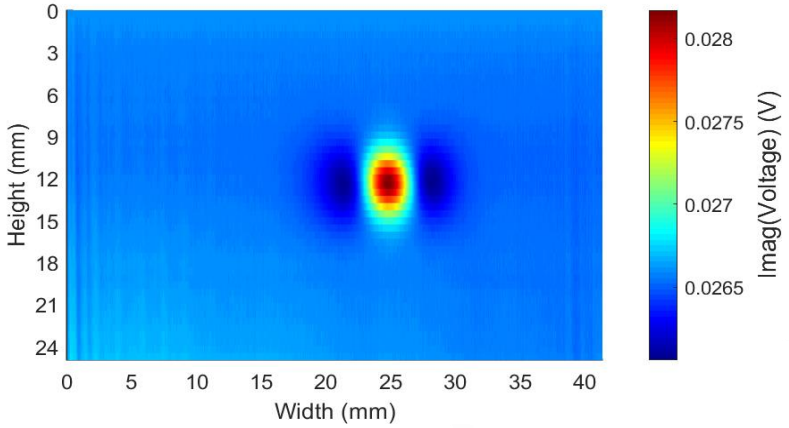
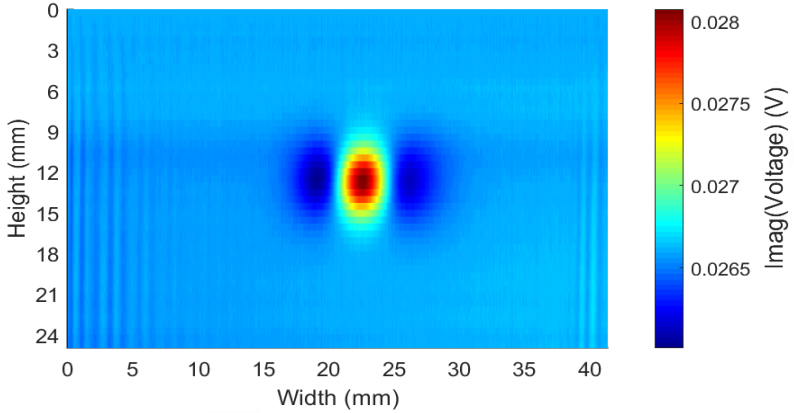
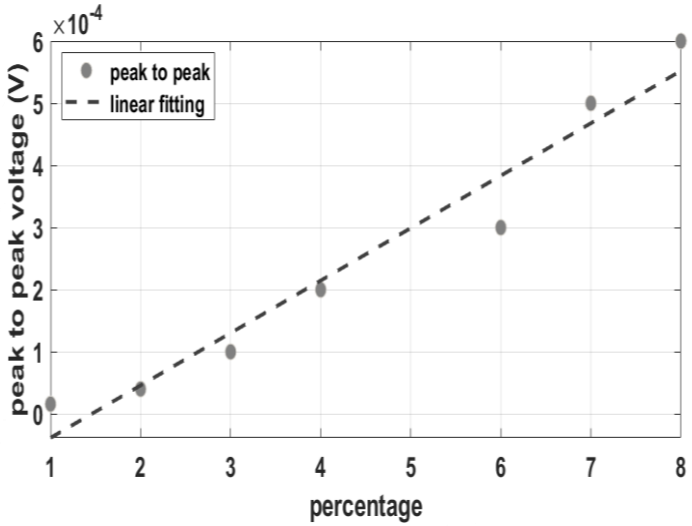
Quantification of defect depth











- ✓ **Gives clear images of the defect**
- ✓ **A strong correlation between the defect depth and the signal strength**

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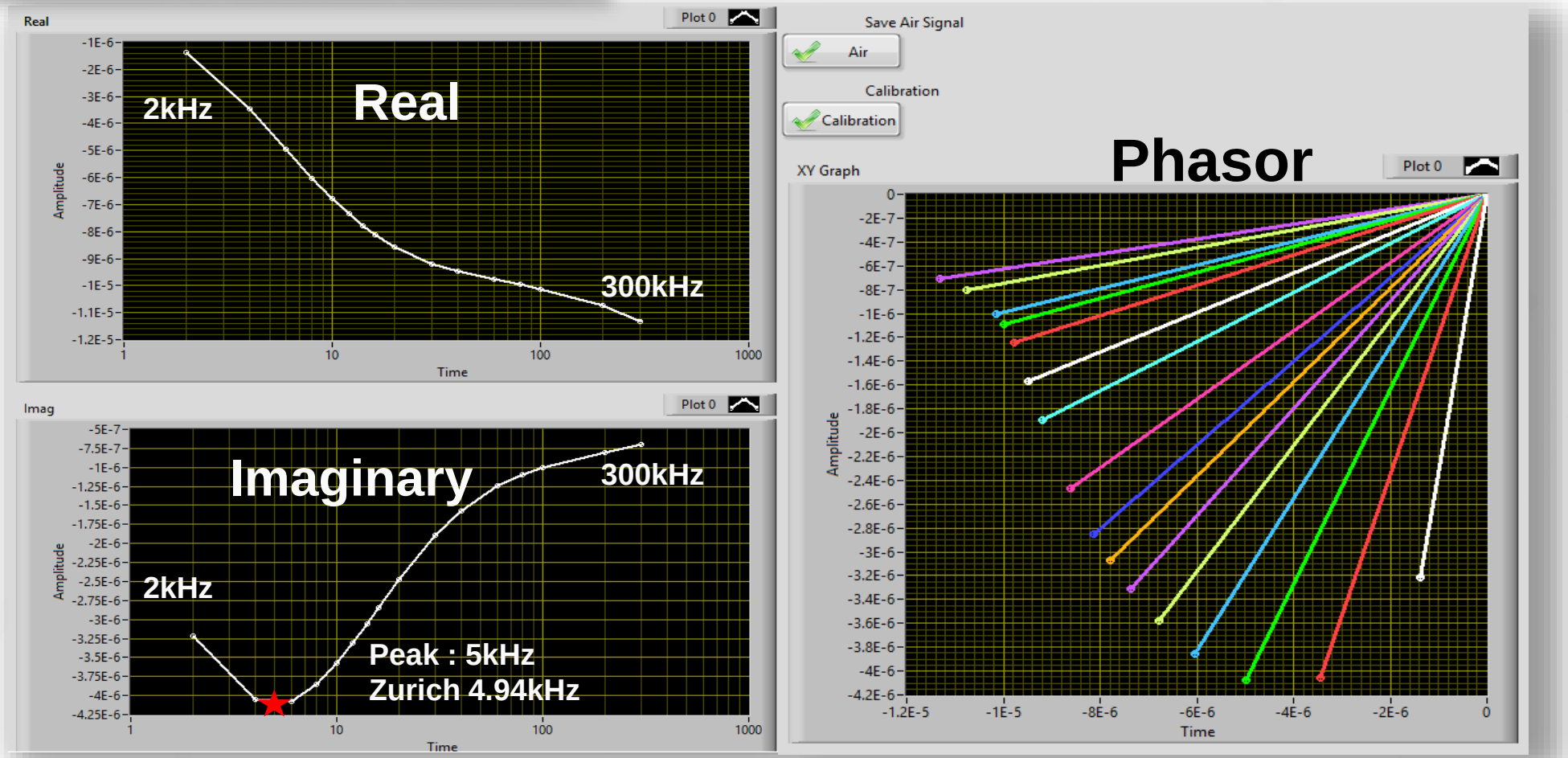
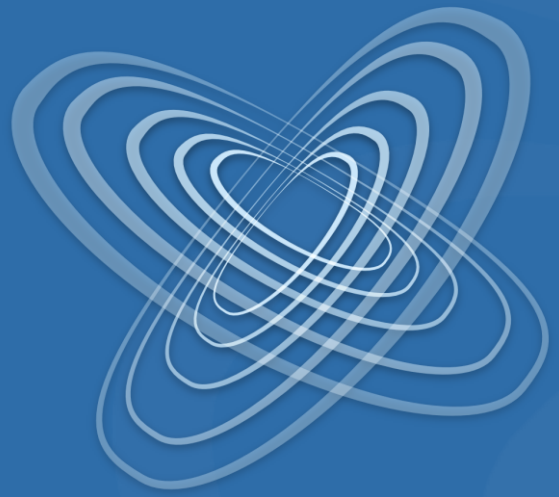
Characterization of detection materials



✓ **Material properties can be determined by multi-frequency electromagnetic signals**

Thank You!



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Thank You!

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