



Inventors

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Conformal Surface Conductivity Probe

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Background

The aerospace industry is constantly developing testing techniques to improve efficiency, and reduce cost. One dilemma with current testing techniques on aircraft is the inability to accurately detect surface and subsurface defects. These defects are often caused by service induced cracks that can be a result of fatigue or stress corrosion. Additionally, methods used to measure surface conductivity are primitive and can leave small indents on the surface of the object being tested. The uneven surface created gives an inaccurate reading of the conductivity making inspection difficult. Thus, there is a need to create a conductivity probe that is accurate, easy to use, and affordable.

Invention Description

Researchers at ASU have developed a Non-contact Conformal Conductivity Probe that improves efficiency, and reduces cost. The design consists of four sensors perpendicular to one-another that have a large detection range and extract information about the object's geometry without making contact. Furthermore, the probe sensors display defects on a three dimensional graph allowing us to view precise locations of surface defects. The elimination of contact methods phases out the need for expensive electrodes, waveguide probes, or any other device that makes physical contact with the surface. This probe design effectively increases accuracy while reducing the cost of inspections.

Intellectual Property

Status:

Pending

Potential Applications

- Aircraft Inspection
- Additive Manufacturing Inspection
- Rapid Prototyping
- Calibration

Contact

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Benefits and Advantages

- **Perpendicular Orientation of Sensors** –
 - The placement of the sensors passes an electrical current through each sensor in order to give an output for the current strength
 - Inspection becomes non-contact, eliminating the need for devices that make physical contact with the surface
- **Small Resonator** – The small size of the resonator permits quick inspection of curved surfaces, reducing maintenance cost
- **Ability to Calibrate** – The framework can generate a calibration curve by using an analytical model of a device being studied