**METHOD**

- 5-peak Hann windowed sinusoid is created.
- Modulated signals were transmitted using a waveform generator.
- The waveform is amplified creating a ±25V signal which is sent to the actuation PZT.
- The sensing PZT detects the received signal and imparts the data to the Oscilloscope.
- The Oscilloscope also collect data from the actuation PZT.

**BACKGROUND**

Adhesively bonded joints offer the potential to reduce weight, simplify assembly, reduce stress concentrations and reduce cost. There is limited abilities to inspect bond lines for quality, defects, or failures. Ultrasonic non destructive inspection has been found to be sensitive to many of the defects that can occur in bond lines.

**SPECIMEN**

The specimen consists of an aluminum plate bonded together with a piezoelectric actuator and a piezoelectric sensor mounted on the surface.

**RESULTS**

The "damage" is simulated on the specimen by adding a small patch of Play-Doh.

The following presented graph shows the results of data processing for signals at 450 kHz.

**ASSUMPTIONS**

- Environmental factors, like Temperature, Pressure, etc., are not taken into consideration
- Damage is defined relative to the baseline waveform, i.e., if the pristine state specimen is damaged itself, then the damage does not get detected by the method
- The scatter signal is considered as noise and does not have any impact on the results

**FUTURE OBJECTIVES**

- To test the experiment with Laminate Structures
- Determining a method to find the location of the damage
- Modify signals to improve accuracy
- Investigate the geometry of the PZTs
- Investigate the geometry of the specimen

**ACKNOWLEDGEMENT**

I would like to appreciate and thank Dr. Nathan Salowitz and Hussain Altammar for all their time and help. I would also like to thank my family and friends for their continued love and support.

**BIBLIOGRAPHY**


**CONTACT INFORMATION:** Sucheta Roy  
roys@uwm.edu  
(414)-514-0606