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## **Experimental Study for Microwave-Induced Thermoacoustic Tomography**

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Microwave-Induced Thermoacoustic Tomography (MI-TAT) is a noninvasive hybrid modality which improves contrast by using thermoelastic wave generation induced by microwave absorption. Ultrasonography is widely used in medical practice as a low-cost alternative and supplement to magnetic resonance imaging (MRI). Although ultrasonography has relatively high image resolution (depending on the ultrasonic wavelength at diagnostic frequencies), it suffers from low image contrast of soft tissues. In this work samples are irradiated with sub-microsecond electromagnetic pulses inducing acoustic waves in the sample that are then detected with an unfocused transducer. The advantage of this hybrid modality is the ability to take advantage of the microwave absorption coefficients which provide high contrast in samples. This in combination with the superior spatial resolution of ultrasound waves is important to providing a low-cost effective imaging technique. Here we propose to use this hybrid imaging technique to image composite materials to further investigate the NDE applications for MI-TAT.