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A Novel Approach to High-temperature In-situ Ultrasonic NDE Using Magnetostriction

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Online ultrasonic NDE at high-temperature is of much interest to the power, process and automotive industries in view of possible savings in down-time. This paper describes a novel approach to develop ultrasonic transducers capable of high-temperature in-situ operation using the principle of magnetostriction. Preliminary design from previous research by the authors [1] is extended for operation at 1 MHz, and elevated temperatures by using MetGlas [2] as the magnetostrictive core. Ultrasonic signals in pulse-echo mode are experimentally obtained from the ultrasonic transducer thus developed, in simulated high temperature environment of 350 °C for 10 hours. Advantages and challenges for practical deployment of this approach are discussed.

References:

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