

Public Abstract

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Title:OPTIMIZATION OF ELECTROMAGNETIC ACOUSTIC TRANSDUCERS FOR NONDESTRUCTIVE EVALUATION OF CONCRETE STRUCTURES

The National Bridge Inventory (NBI) indicates that there are more than 130,000 prestressed concrete bridges in the United States and about 37,000 are more than 30 years old. Prestressing steel strands are an important construction element used in these bridges and are critical to their performance. Presently there is no effective inspection/NDE technology for condition assessment of these prestressing strands once they are embedded in concrete. The overall goal of the research is to develop a sensor technology to detect deterioration in embedded steel strands in concrete structures. The sensor technology to be developed is an Electromagnetic Acoustic transducer (EMAT) based on the *Magnetostriction* effect or *Joule* effect. The objective of this part of the research is to maximize the efficiency of an EMAT by optimizing its design parameters in order to overcome the limitation of significant wave attenuation and low level signals that is characteristic of these sensors when embedded in concrete.