DISCOVERING HIDDEN DEGRADATION USING ULTRASONIC WAVE PROPAGATION: THEORY AND EXPERIMENTATION

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KEYWORDS: ultrasonics; hidden degradation; concrete structures; steel structures; pulse transmission; meshless technique

Building and maintenance of civil infrastructure is one of the largest contributors in global warming. Extending the life of infrastructure through regular monitoring and retrofitting can reduce environmental damage to a great extent. Structures degrade due to a variety of reasons such as environmental actions, overloading, and natural calamities. Inspection, diagnosis and prognosis of damage in installations are imperative for avoiding their catastrophic failures. However, a reliable tool for early detection of damages in large structures has remained elusive.

Ability ultrasonic guided waves to travel long distances and pick up the signatures of structural damage makes them most promising among the handful of techniques available. Yet, there are formidable challenges in theoretical understanding and field implementations. The author reported the efficacy of ultrasonics in discovering hidden degradation such as corrosion inside reinforced concrete[1] and submerged plated structures[2]. The theoretical development of propagation of ultrasonic waves was also reported[3]. This paper will report the present status of ultrasonics in structural health monitoring. Both theoretical and experimental developments will be discussed. The pros and cons and future potentials of the technology will be mentioned.

REFERENCES