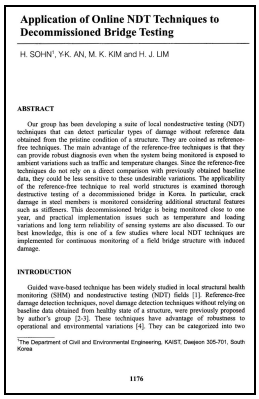

Application of Online NDT Techniques to Decommissioned Bridge Testing

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ABSTRACT

Our group has been developing a suite of local nondestructive testing (NDT) techniques that can detect particular types of damage without reference data obtained from the pristine condition of a structure. They are coined as reference-free techniques. The main advantage of the reference-free techniques is that they can provide robust diagnosis even when the system being monitored is exposed to ambient variations such as traffic and temperature changes. Since the reference-free techniques do not rely on a direct comparison with previously obtained baseline data, they could be less sensitive to these undesirable variations. The applicability of the reference-free technique to real world structures is examined thorough destructive testing of a decommissioned bridge in Korea. In particular, crack damage in steel members is monitored considering additional structural features such as stiffeners. This decommissioned bridge is being monitored close to one year, and practical implementation issues such as temperature and loading variations and long term reliability of sensing systems are also discussed. To our best knowledge, this is one of a few studies where local NDT techniques are implemented for continuous monitoring of a field bridge structure with induced damage.

INTRODUCTION

Guided wave-based technique has been widely studied in local structural health monitoring (SHM) and nondestructive testing (NDT) fields [1]. Reference-free damage detection techniques, novel damage detection techniques without relying on baseline data obtained from healthy state of a structure, were previously proposed by author's group [2-3]. These techniques have advantage of robustness to operational and environmental variations [4]. They can be categorized into two

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Ключевые слова:

Содержание.