合成聚焦影像法掃描含鋼筋混凝土結構缺陷之參數變化研究

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摘要

This paper presents the results of applying a new nondestructive testing technique to present the interior information of a defective reinforced concrete matrix with the scanning images. This new method is based on utilizing the transient elastic stress waves integrated with the signal processing method of Synthetic Aperture Focusing Technique (SAFT). In this study, the stress wave propagation in the concrete block was simulated with finite element method and the resultant signals were processed with SAFT so that the distribution of the embedded defects may be presented using the grey-scaled images. In this research the effects of various conditions of rebars on the testing signals were simulated and studied. The varied conditions included the spacing of the rebars, the size of the rebars, the thickness of the concrete cover, and the layers of the rebars, etc. Finally, the conclusion on the potential and the limit of this new testing method applied on scanning the reinforced concrete structures will be proposed.

關鍵字：Nondestructive test, Synthetic Aperture Focusing Technique, Rebars, Concrete structure, Scanning defects