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## Experimental Study of a Model-Free Method for Identification of Stiffness-Related Structural Damages

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This paper presents a theoretical derivation and an experimental verification of a model-free method for identification of stiffness-related damages. The proposed method requires no parametric numerical model of the monitored structure, which obviates the need for initial model updating and fine tuning. The paper introduces the general methodology, including the inverse problem, focuses it on stiffness-related damages, and reports on an experimental verification. A 4-meter-long, 70-element truss steel structure made of a commercially available system of nodes and connecting tubes is used for that purpose. Damage is simulated by an intentional replacement of a structural element.

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**Ключевые слова:**

### Содержание

Abstract

Introduction

The direct problem – general methodology

The direct problem – stiffness-related damages

The inverse problem

Experimental verification

Conclusion

Acknowledgements