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Static Deformation Measurements with Fiber-Optic Sensors: A Long-Term Monitoring Experiment on R.C. Beams

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ABSTRACT

The Authors have been conducting a long-term static monitoring experiment to assess the validity of various damage detection algorithms consisting in non-model-based statistical data processing. These algorithms, or at least some of them, have been demonstrated to be very effective to the purpose of damage identification, even for small levels of damage comparable to ones generated in reinforced concrete structures by incipient concrete degradation and corrosion of reinforcing steel, by means of numerical simulations conducted on two-dimensional finite elements models.

The tests have been conducted in Italy, on two specimens of pre-stressed reinforced concrete beams equipped with SOFO fiber optic and temperature sensors and placed outdoor. The campaign was started in April 2007 and it is still going on. During the tests, several events have been artificially produced: at the beginning of the experiment a ballast load has been positioned on the beams; subsequently, various known levels of damage have been introduced in one beam. The other beam was kept intact for reference. Preliminary data processing has disclosed substantial differences between the numerical simulations and the measurements obtained on the field.

The paper resumes the considerations already formulated and presents the first results from the processing of the complete time-series.

INTRODUCTION

In the last years an increasing interest has been devoted to the application of SDN techniques to assess the actual safety conditions of existing civil structures

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**Ключевые слова:**

### Содержание.

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