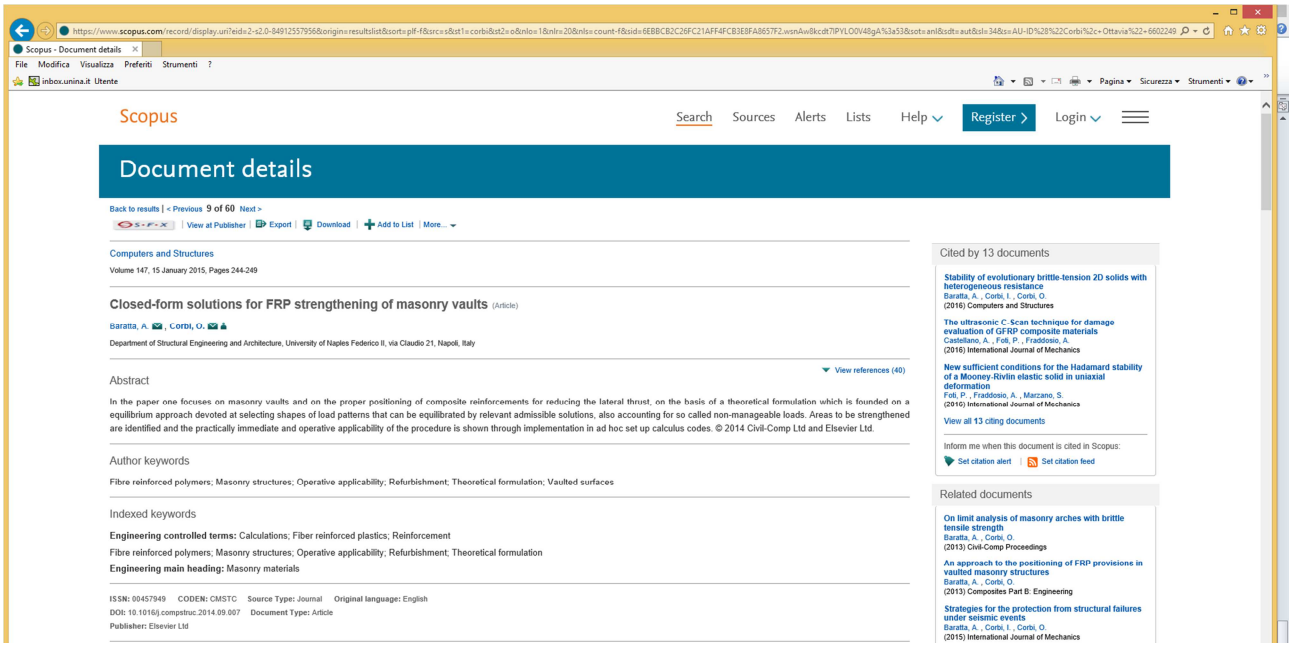

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Computers and Structures

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Closed-form solutions for FRP strengthening of masonry vaults (Article)

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Abstract

In the paper one focuses on masonry vaults and on the proper positioning of composite reinforcements for reducing the lateral thrust, on the basis of a theoretical formulation which is founded on a equilibrium approach devoted at selecting shapes of load patterns that can be equilibrated by relevant admissible solutions, also accounting for so called non-manageable loads. Areas to be strengthened are identified and the practically immediate and operative applicability of the procedure is shown through implementation in ad hoc set up calculus codes. © 2014 Civil-Comp Ltd and Elsevier Ltd.

Author keywords

Fibre reinforced polymers; Masonry structures; Operative applicability; Refurbishment; Theoretical formulation; Vaulted surfaces

Indexed keywords

Engineering controlled terms: Calculations; Fiber reinforced plastics; Reinforcement

Fibre reinforced polymers; Masonry structures; Operative applicability; Refurbishment; Theoretical formulation

Engineering main heading: Masonry materials

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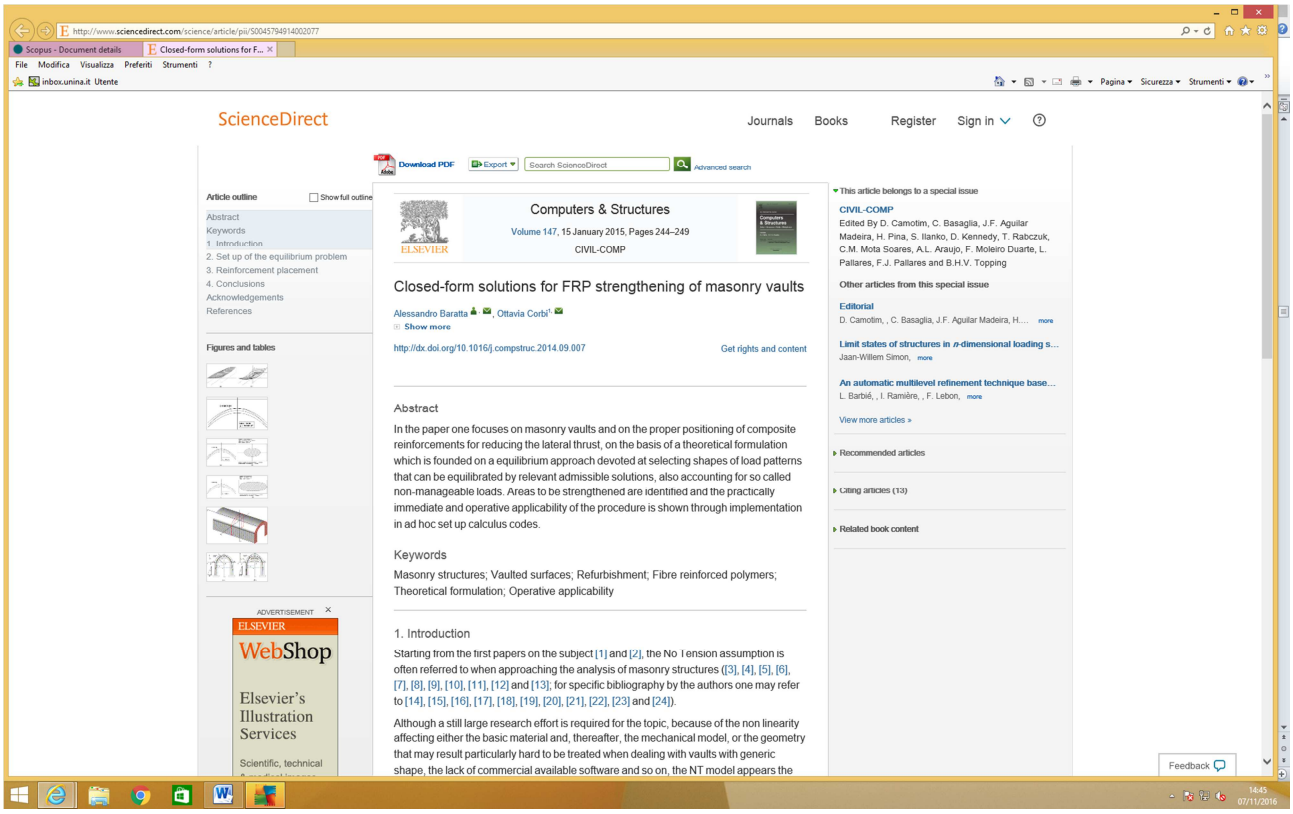

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In the paper one focuses on masonry vaults and on the proper positioning of composite reinforcements for reducing the lateral thrust, on the basis of a theoretical formulation which is founded on a equilibrium approach devoted at selecting shapes of load patterns that can be equilibrated by relevant admissible solutions, also accounting for so called non-manageable loads. Areas to be strengthened are identified and the practically immediate and operative applicability of the procedure is shown through implementation in ad hoc set up calculus codes.

Keywords

Masonry structures; Vaulted surfaces; Refurbishment; Fibre reinforced polymers; Theoretical formulation; Operative applicability

1. Introduction

Starting from the first papers on the subject [1] and [2], the No I ension assumption is often referred to when approaching the analysis of masonry structures ([3], [4], [5], [6], [7], [8], [9], [10], [11], [12] and [13]; for specific bibliography by the authors one may refer to [14], [15], [16], [17], [18], [19], [20], [21], [22], [23] and [24]).

Although a still large research effort is required for the topic, because of the non linearity affecting either the basic material and, thereafter, the mechanical model, or the geometry that may result particularly hard to be treated when dealing with vaults with generic shape, the lack of commercial available software and so on, the NT model appears the

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