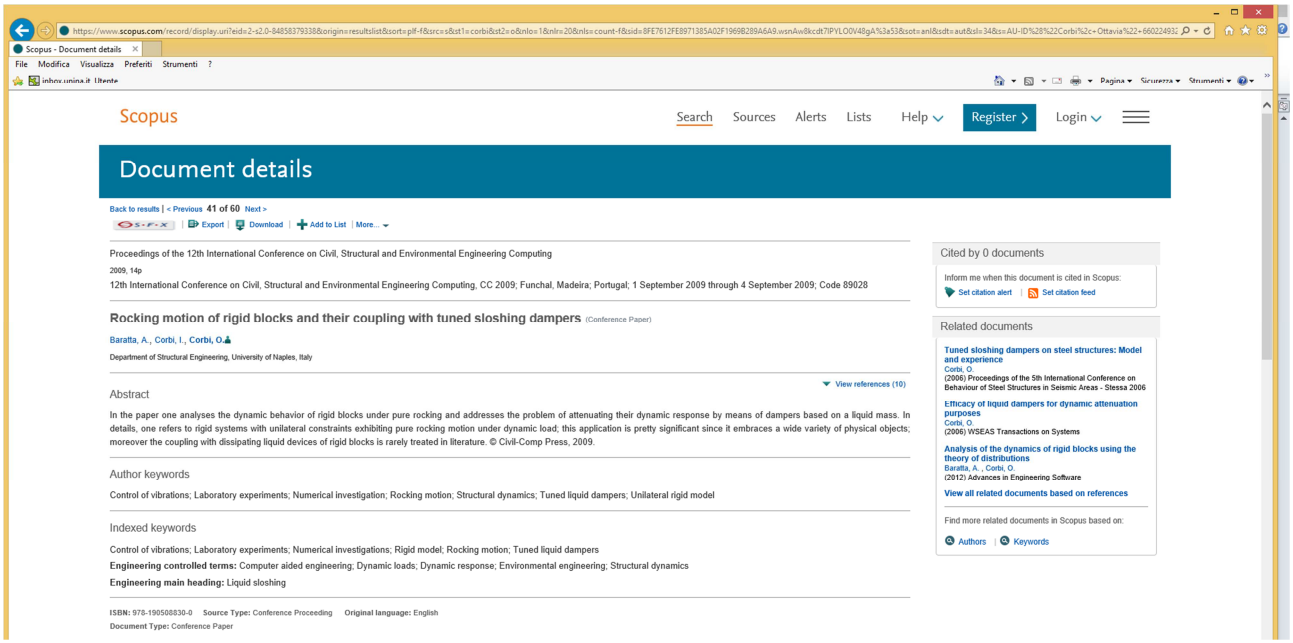

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Rocking motion of rigid blocks and their coupling with tuned sloshing dampers (Conference Paper)

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Abstract

In the paper one analyses the dynamic behavior of rigid blocks under pure rocking and addresses the problem of attenuating their dynamic response by means of dampers based on a liquid mass. In details, one refers to rigid systems with unilateral constraints exhibiting pure rocking motion under dynamic load; this application is pretty significant since it embraces a wide variety of physical objects; moreover the coupling with dissipating liquid devices of rigid blocks is rarely treated in literature. © Civil-Comp Press, 2009.

Author keywords

Control of vibrations; Laboratory experiments; Numerical investigation; Rocking motion; Structural dynamics; Tuned liquid dampers; Unilateral rigid model

Indexed keywords

Control of vibrations; Laboratory experiments; Numerical investigations; Rigid model; Rocking motion; Tuned liquid dampers

Engineering controlled terms: Computer aided engineering; Dynamic loads; Dynamic response; Environmental engineering; Structural dynamics

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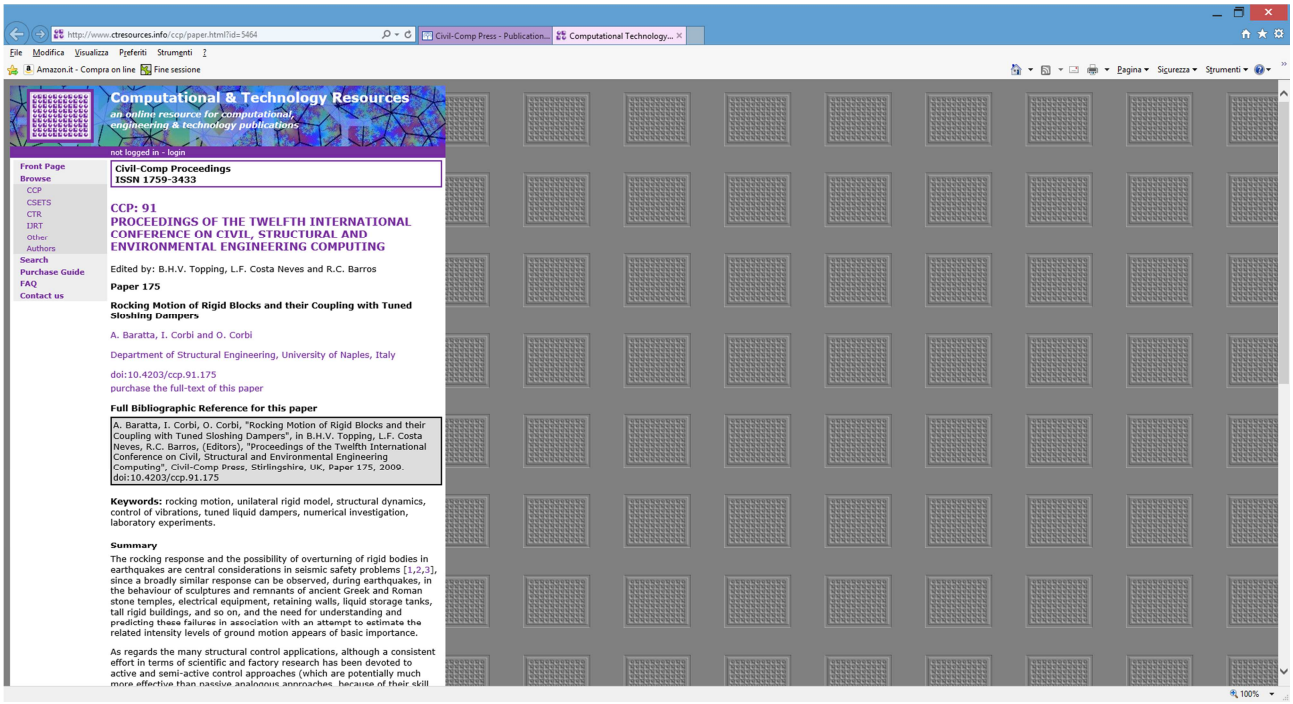

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Civil-Comp Proceedings
ISSN 1759-3433

CCP: 91
PROCEEDINGS OF THE TWELFTH INTERNATIONAL CONFERENCE ON CIVIL, STRUCTURAL AND ENVIRONMENTAL ENGINEERING COMPUTING

Edited by: B.H.V. Topping, L.F. Costa Neves and R.C. Barros

Paper 175

Rocking Motion of Rigid Blocks and their Coupling with Tuned Sloshing Dampers

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doi:10.4203/ccp.91.175

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A. Baratta, I. Corbi, O. Corbi, "Rocking Motion of Rigid Blocks and their Coupling with Tuned Sloshing Dampers", in B.H.V. Topping, L.F. Costa Neves, R.C. Barros, (Editors), "Proceedings of the Twelfth International Conference on Civil, Structural and Environmental Engineering Computing", Civil-Comp Press, Stirlingshire, UK, Paper 175, 2009. doi:10.4203/ccp.91.175

Keywords: rocking motion, unilateral rigid model, structural dynamics, control of vibrations, tuned liquid dampers, numerical investigation, laboratory experiments.

Summary

The rocking response and the possibility of overturning of rigid bodies in earthquakes are central considerations in seismic safety problems [1,2,3], since a broadly similar response can be observed, during earthquakes, in the behaviour of sculptures and remnants of ancient Greek and Roman stone temples, electrical equipment, retaining walls, liquid storage tanks, tall rigid buildings, and so on, and the need for understanding and predicting these failures in association with an attempt to estimate the related intensity levels of ground motion appears of basic importance.

As regards the many structural control applications, although a consistent effort in terms of scientific and factory research has been devoted to active and semi-active control approaches (which are potentially much