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Reviewer Invitation for STRUCTURES-D-23-05040

1 message

STRUCTURES <em@editorialmanager.com> Thu, Oct 19, 2023 at 8:21 AM
Reply-To: STRUCTURES <support@elsevier.com>
To: Omar Qarani Aziz <omerqarani@gmail.com>

Ms. Ref. No.: STRUCTURES-D-23-05040
Title: Human-structure interaction effects on lightweight footbridges with tuned mass dampers
Authors: Michael Fouli; Alfredo Camara
Structures

Dear Dr. Aziz,

Given your expertise in this area, I would appreciate your comments on the above paper.

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I look forward to hearing from you in the near future.

Yours sincerely,

Pedro F Silva
Associate Editor
Structures

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ABSTRACT:
Human-structure interaction (HSI) combined with near-resonant stepping frequencies can result in large dynamic effects in modern footbridges. These structures are prone to vibrations due to their inherently low damping and slenderness. Currently, Tuned Mass Dampers (TMD) are used in footbridges to reduce the pedestrian-induced vibrations and meet the serviceability limit state of vibrations, but their practical design does not account for HSI effects. This study analyses the dynamic response of a lightweight footbridge subject to different pedestrian load models, with and without TMD. Compared with the response ignoring HSI, the results show that the interaction between the dynamic response of the pedestrians and the structure can reduce the vibrations in the deck, but they exceed comfort limits based on peak and root mean square (RMS) acceleration criteria. In order to reduce the oscillations to a comfortable level, a TMD located at midspan has been designed following the classical optimisation method. The efficiency of the damper in resonant conditions is demonstrated in the time and frequency domains, even under a large number of synchronised pedestrians interacting with the structure, suggesting that crowds do not introduce important de-tuning effects in the TMD.

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