

Zeitschrift: IABSE reports = Rapports AIPC = IVBH Berichte
Band: 70 (1993)

Artikel: Testing the steeple of the Peter and Paul Cathedral in Saint Petersburg
Autor: Racha, Jossig / Boris, Lubarov / Anatoly, Jouravlev
DOI: <https://doi.org/10.5169/seals-53306>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 01.04.2026

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

Testing the Steeple of the Peter and Paul Cathedral in Saint Petersburg

Contrôle du clocher de la cathédrale de St. Pierre et Paul à Saint Petersburg

Kontrolle des Glockenturms der St-Peter und Paul-Kathedrale in St. Petersburg

Jossif RACHA

Civil Eng.
Institute of Steel Structures
Saint Petersburg, Russia

Lubarov BORIS

Civil Eng.
Institute of Steel Structures
Saint Petersburg, Russia

Jouravlev ANATOLY

Mechanical Eng.
Institute of Steel Structures
Saint Petersburg, Russia

The steel steeple with a cross of 60 m in height (from el. + 60.0 to el. 120.0) was erected in 1857 in place of a wooden one destroyed by fire. When examining the cathedral structures in 1991, cracks were found in the masonry at an el of 40.0 m in a place where the steeple anchoring beams had been built in.

The dynamic loading tests of the steeple structures were performed for experimental determination of the following:

- natural frequency of the first mode of oscillation and its comparison with the design mode;
 - decrement of oscillation for calculation of dynamic forces;
 - values of the revealed crack;
 - an oscillograph and a cinecamera started working simultaneously with the radio command.
- The tests were performed eight times.

The value $\delta = 0.0875$ with an amplitude of strain $\pm 9,6$ MPa is explained by the fact that the copper sheets of the steeple displace in oscillation which is clearly seen and dissipation of the oscillation energy accelerated due to dry friction.

In the cracked area at an elevation of 40.0 m, vertical displacement was recorded of the steel supporting beam relative to the brick masonry with an amplitude of ± 0.01 mm at a maximum amplitude of the steeple 70 mm at an el. of + 115.0.

The diagram of the tests is shown in Fig. 1. The results are presented in Table 1.

The tests showed coincidence of the design and the field strain characteristics of the steeple structures. The verification calculations, the results of examination and the field tests made it possible to give a complex assessment of the condition of one of the main historical structures of Saint Petersburg.

