

[1]范云蕾,郭玉荣,肖岩.基于NetSLab远程协同试验平台的多跨桥梁抗震研究[J].自然灾害学报,2010,03:126-131.

点击

FAN Yun-lei, GUO Yu-rong, XIAO Yan. Seismic research into a multi-span bridge based on remote concerted testing platform NetSLab[J]., 2010, 03: 126-131.

复制

基于NetSLab远程协同试验平台的多跨桥梁抗震研究

《自然灾害学报》 [ISSN:/CN:23-1324/X] 期数: 2010年03期 页码: 126-131 栏目: 出版日期: 2010-03-01

Title: Seismic research into a multi-span bridge based on remote concerted testing platform NetSLab

作者: [范云蕾^{1; 3}](#); [郭玉荣¹](#); [肖岩^{1; 2}](#)

1. 湖南大学土木工程学院教育部建筑安全与节能重点实验室, 湖南 长沙 410082;
2. 南加利福尼亚大学土木系, 洛杉矶, CA 90089, 美国;
3. 哈尔滨工业大学土木学院, 黑龙江 哈尔滨 150090

Author(s): [FAN Yun-lei^{1; 3}](#); [GUO Yu-rong¹](#); [XIAO Yan^{1; 2}](#)

1. MOE Key Laboratory of Building Safety and Energy Efficiency, College of Civil Engineering, Hunan University, Changsha 410082, China;
2. Dept. of Civil Engineering, University of Southern California, Los Angeles, CA90089, USA;
3. School of Civil Engineering, Harbin Institute of Technology, Harbin 150090, China

关键词: [加固](#); [远程协同](#); [试验平台](#); [桥梁结构](#)

Keywords: [retrofit](#); [remote collaboration](#); [testing platform](#); [bridge structures](#)

分类号: P315.9

DOI: -

文献标识码: -

摘要: 利用远程协同试验平台NetSLab,对一个多跨的桥梁结构进行了抗震试验研究。该平台是基于客户机/服务器概念开发的,提出了供结构拟动力远程试验用的数据模型和应用协议。它能够在远程结构实验室或计算机之间通过互联网传送控制和反馈数据。桥梁系统由3个柱子组成,分别在湖南大学、哈尔滨工业大学和清华大学之间模拟。湖南大学站点试验模型为GFRP约束弯曲型钢筋混凝土桥墩柱,哈尔滨工业大学站点试验模型为CFRP约束剪切型钢筋混凝土桥墩柱,清华大学站点则进行数值模拟。对该桥梁进行了3个水准地震作用下的远程协同拟动力试验,地震动加速度选用EICentro波。试验结果表明,GFRP加固柱具有良好的延性及抗震性能,CFRP加固可阻止柱子的脆性剪切破坏,有效地提高其滞回性能及能量耗散能力,从而可大大地提高整个桥梁系统的抗震能力。

Abstract: Seismic response of a multi-span bridge is investigated in this study using an Internet based testing platform. The platform, NetSLab, was developed based on client/server concept along with a proposed data model and communication protocols. The platform is capable of transferring control and feedback data and signals among remotely located structural testing laboratories or computers connected by Internet. In these tests, a three-pier bridge system was simulated in which a glass fiber reinforced plastic(GFRP) retrofitted reinforced concrete pier

导航/NAVIGATE

[本期目录/Table of Contents](#)

[下一篇/Next Article](#)

[上一篇/Previous Article](#)

工具/TOOLS

[引用本文的文章/References](#)

[下载 PDF/Download PDF\(1375KB\)](#)

[立即打印本文/Print Now](#)

[推荐给朋友/Recommend](#)

统计/STATISTICS

摘要浏览/Viewed 140

全文下载/Downloads 89

[评论/Comments](#)



was tested physically in Hunan University and a carbon fiber reinforced plastic (CFRP) reinforced concrete retrofitted pier was tested physically in Harbin Institute of Technology and the third one was simulated numerically in Tsinghua University. The bridge was loaded to simulate the responses under ground motions corresponding to earthquake hazards for a highly seismic location with 63%, 10% and 2% exceedance probabilities in 50 years. The experiments demonstrate that retrofitted column with GFRP has good ductility and energy dissipation capability, CFRP can prevent brittle shearing damage of RC short column, make ductility and the energy dissipation capacity of the column increase greatly thus improving the seismic behavior of the bridge system.

参考文献/REFERENCES

- [1] Information on <http://www.nees.org/>
- [2] Pauschke J, Anderson T, L, Goldstein S, N, et al. Construction status of the George E. Brown, Jr. Network for Earthquake Engineering Simulation. Proceedings of the Seventh U.S. National Conference on Earthquake Engineering, 2002
- [3] Yang Y. S., Wang S. J., Wang J., et al. ISEE: Internet-based Simulations for earthquake engineering, Part I: the database approach [C] // 13th world conference on Earthquake Engineering, 2004: 1910
- [4] Wang K. J., Wang S. J., Yang Y. S., et al. ISEE: Internet-based simulations for earthquake engineering, Part II: the application protocol approach [C] // 13th world conference on Earthquake Engineering, 2004: 1548
- [5] Ohtani K., Ogawa N., Katayama T., Shibata H. 3-D Full-Scale Earthquake Testing Facility and Earthquake Engineering Network [C] // Proceedings of the Third World Conference on Structural Control, 2002: 1019-1024
- [6] Kmi J. K. KOCED Collaboratory Program [C] // Proceedings of the 2004 ANCEER Annual Meeting: Networking of Young Earthquake Engineer Researchers and Professionals, 2004
- [7] Xiao Y., Hu Q., Guo Y. R., et al. Development of a network platform for remote hybrid dynamic testing. [C] // 13th world conference on earthquake engineering, 2004: 3048
- [8] Xiao Y., Hu Q., Guo Y. R., et al. Networked platform for remote structural testing and shared use of laboratories [J] // Progress in natural science, 15(12)2005: 1135-1142
- [9] Priestley M. J. N., Xiao Y., Holombo J., et al: The Northridge Earthquake of January 17, 1994-Damage Analysis of Selected Freeway Bridge [R] // Chapter 3, Priestley, Seible and Uang, Structural Systems Research Report, I-10-Fairfax/Washington Undercrossing, No. SSRP94/06, 1994

备注/Memo: 收稿日期: 2008-9-23; 改回日期: 2009-7-13。

基金项目: 国家自然科学基金资助项目(90715036、50778068); 长江学者创新团队项目(IRT0619)

作者简介: 范云蕾(1982-), 女, 博士研究生, 主要从事远程协同拟动力试验研究. E-mail: fanyunle@i163.com

更新日期/Last Update: 1900-01-01