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形状记忆合金丝-橡胶支座钢框架隔震效果分析 (PDF)

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Title: Analysis of isolation effect of steel frame with shape memory alloy fiber-rubber bearing

作者: [刘海卿](#); [王学庆](#); [杨飞](#); [崔衍斌](#)
辽宁工程技术大学土木建筑工程学院, 辽宁 阜新 123000

Author(s): [LIU Hai-qing](#); [WANG Xue-qing](#); [YANG Fei](#); [CUI Yan-bin](#)
College of Civil Engineering and Architecture, Liaoning Technical University, Fuxin 123000, China

关键词: [形状记忆合金](#); [SMA丝-橡胶复合支座](#); [钢框架](#); [隔震结构](#)

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摘要: 根据作者开发研制的形状记忆合金丝-橡胶复合支座,建立了传统抗震结构和两种不同支座隔震结构体系的运动方程,并对某个实际工程四层钢框架结构进行了数值模拟,分析其在阪神波和ElCentro波作用下的时程反应。研究表明,SMA丝-橡胶复合支座是一种很有效的隔震装置,将它用于钢框架结构,能有效地减小结构的位移、速度及加速度时程反应,而对于加速度峰值较大的阪神波的隔震效果更为明显,说明该复合支座能有效地提供罕遇地震作用下钢结构的隔震效果。

Abstract: Motion equations of traditional earthquake resistant structure and shock isolation structure with different isolators were presented based on shape memory alloy (SMA) fiber-laminated rubber bearing developed by the authors. Numerical simulation of a four-floor steel-frame structure with different isolators was carried out, to analyze the seismic response of structure excited by Hanshin and El Centro waves. Analysis shows that SMA fiber-laminated rubber bearing works very well in shock isolation and the dynamic response, such as displacement, velocity and acceleration of steel-frame structure supported on it can be reduced effectively. The larger acceleration of seismic wave, the more remarkable of isolation effect, that is to say, SMA fiber-laminated rubber bearing makes isolation effect dramatically better when structure is excited by rare earthquake.

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作者简介:刘海卿(1965-),男,教授,主要从事工程结构抗震及振动控制研究.E-mail:lhq2008@163.com
