

## **A New Low Cost Seismic Response Controlling Structures with Semi Base Isolation Devices**

**Authors :** M. Ezati Kooshki, A. Abbaszadeh Shahri

**Abstract :** A number of devices used to control seismic structures have been developed during the past decades. One of the effective ways to reduce seismic forces transmitted to the buildings is through the base isolation systems, but the use of these devices is currently limited to large and expensive buildings. This study was an attempt to introduce an effective and low cost way to protect of structures against grand motions by a semi base isolation system. In this new way, structures were not completely decoupled of bases and the natural frequency of structures was changed due to earthquake by changing the horizontal stiffness; therefore, ground excitation energy was dissipated before entering the structures. For analyzing the dynamic behavior, the new method used finite element software (ABAQUS 6-10-1). This investigation introduced a new package of semi base isolation devices with a new material constitutive, but common in automobile industries, seeking to evaluate the effects of additional new devices on the seismic response when compared with structures without additional devises for different ground motions. The proposed semi base isolation devices were applied to a one story frame and the time history analysis was conducted on the record of Kobe earthquake (1995). The results showed that the efficiency reduced the floor acceleration and displacement, as well as velocity.

**Keywords :** semi base isolation system, finite element, natural frequency, horizontal stiffness

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