

## **Nonlinear Analysis of Steel Fiber Reinforced Concrete Frames Considering Shear Behaviour of Members under Varying Axial Load**

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**Abstract :** The result of the past earthquakes has shown that insufficient amount of stirrups and brittle behavior of concrete lead to the shear and flexural failure in reinforced concrete (RC) members. In this paper, an analytical model proposed to predict the nonlinear behavior of RC and SFRC elements and frames. In this model, some important parameter such as shear effect, varying axial load, and longitudinal bar buckling are considered. The results of analytical model were verified with experimental tests. The results of verification have shown that the proposed analytical model can predict the nonlinear behavior of RC and SFRC members and also frames accurately. In addition, the results have shown that use of steel fibers increased bearing capacity and ductility of RC frame. Due to this enhancement in shear strength and ductility, insufficient amount of stirrups, which resulted in shear failure, can be offset with usage of the steel fibers. In addition to the steps taken, to analyze the effects of fibers percentages on the bearing capacity and ductility of frames parametric studies have been performed to investigate of these effects.

**Keywords :** nonlinear analysis, SFRC frame, shear failure, varying an axial load

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