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Ahmed M. Ismail¹, Mohamed F.M. Fahmy² and Zhishen Wu³

Abstract

In this study, a stress-strain model of fiber-reinforced polymers (FRPs)-confined concrete based on the lateral confinement stiffness was adopted to simulate the lateral response of RC columns retrofitted with external FRP jackets and tested under axial and lateral loads. The adopted model and other five-stress-strain models (established in former studies) were comparatively studied to simulate the seismic response of eight RC-circular columns retrofitted with FRP jackets and experimentally tested under both axial and lateral loads. Compared to the experimental results, the simulation results indicated that all stress-strain models could not identify properly the ultimate lateral displacements of the simulated columns. The adopted stress-strain model was revised to consider the effect of a key influential parameter (eccentricity ratio), which showed a critical impact on the simulation of the seismic response of RC-columns under combined bending and axial loadings. Finally, the proposed model was evaluated in predicting the lateral response of additional three columns and the simulation results exhibited a good agreement with the experimental results.

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