

ABSTRACT

From the important stages in designing of structure is loading and seismic analysis. The used method in this case are divided to linear and nonlinear set. The linear methods like spectrum analysis and equivalent static, because of simplicity have special situation in the seismic codes such as Iran 2800 seismic code.

Since the linear methods are based on elastic behavior of structure, are not able to reflect the responses of structure in inelastic range and this theme is a defect for mentioned methods. Non apply higher modes effect in seismic loading is the other flaws which there is at the static equivalent static method. Because this procedure unlike the spectrum analysis which is a multimode method its lateral load pattern structure is founded based on the main mode shape of structure.

In this research, along the above mentioned defects and improvement the lateral load pattern structure, seismic behavior of some sample steel structure with special moment resisting frame (SMRF) are studied using adaptive pushover analysis (APA) and nonlinear time history analysis (NLTH). Finally according to got results, a lateral load pattern is proposed and some of seismic responses some sample structure which are designed based on this pattern, is evaluated. With pay attention to basis and features of adaptive pushover analysis which the used pattern during analysis has the multimode essence and adapts to structure stiffness at each step, proposed lateral load pattern has the elastic-inelastic and multimodal structure.

Although the main aim of pushover analysis is estimation of seismic demands and evaluation of structure performance against probable earthquakes but, in present research by an innovative procedure, this kind of pushover analysis has been used as a tool for study of lateral load pattern.

Since, the main aim in this dissertation is giving the modified lateral load pattern for asymmetric steel structures, for study the 3D models is used. So according to obtained results, at the end of research some of behavioral specification of structure such as lateral displacement and pushover curve of frames has been studied and evaluated.