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Accurate Algorithm for Selecting Ground Motions Satisfying Code Criteria

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Abstract : For computing the seismic responses of structures, current seismic design provisions permit response history analyses (RHA) that can be used without limitations in height, seismic design category, and building irregularity. In order to obtain accurate seismic responses using RHA, it is important to use adequate input ground motions. Current seismic design provisions provide criteria for selecting ground motions. In this study, the accurate and computationally efficient algorithm is proposed for accurately selecting ground motions that satisfy the requirements specified in current seismic design provisions. The accuracy of the proposed algorithm is verified using single-degree-of-freedom systems with various natural periods and yield strengths. This study shows that the mean seismic responses obtained from RHA with seven and ten ground motions selected using the proposed algorithm produce errors within 20% and 13%, respectively.

Keywords : algorithm, ground motion, response history analysis, selection
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