SESSION KEYNOTE

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Earthquake Design Ground Motion Taking into Account Active Fault Displacement

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Until now, since there is no concrete synthesis method of design ground displacements for structures located near or cross the fault-rupture zones, thus in this paper, it proposed a procedure to conduct seismic analysis on fault-rupture crossing bridge structures. Firstly, relayed on the combination of stochastic Green's function method and theoretical Green's function method, a hybrid synthesis method considered the complete near-fault ground motions was adopted. Then based on the dynamic theory on multiple-support excitation method considering the fling-step displacements, the procedure for seismic design of fault-crossing bridge is briefly presented. And liner analysis on a simple 5-span bridge structure across a reverse surface fault was conducted. The calculation resulted that the non-synchronized excitations of time-histories of displacements lead to significant differences in the seismic behavior of fault-rupture crossing bridge structures. Furthermore, the effects of crossing angle between bridge and fault were explored. The research results could provide a useful reference for the design guidelines for such near-fault bridge engineering.

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