

## عنوان مقاله:

Inelastic Response of a Long Span Bridge under Asynchronous Near-Field Pulse-Like and Far-Field Excitations

## محل انتشار:

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## خلاصه مقاله:

Due to the spatial variations of the strong ground motions and Near-Field (N-F) effects, significant and unexpected damages have been observed in long-span bridges during past earthquakes. One of the outstanding characteristics of N-F motions is the forward directivity effect seen as a single, intense, long period pulse at the beginning of velocity records in the fault-normal direction. To better understand the effect of this pulse and the wave passage effect of spatially correlated motions on the seismic response of long-span bridges in comparison with these bridges' response to the far-field earthquakes, a comprehensive case study has been done in three parts on the finite element model of a long-span bridge: ۱) Uniform excitations of the model bridge with forward directivity pulses and the original records; ۲) Asynchronous excitations with different shear wave velocities for impulsive part of the inputs; and ۳) Comparison of the wave passage effect of two sets of near-field and far-field strong ground motions (SGMs) on the seismic response of the model bridge. The results show that the wave passage effect of forward directivity N-F pulses can have significant influence on the bridge nonlinear response, and it becomes more evident in the soft soils causing severe seismic demands. Even in the case of rock sites, ignoring this effect can result in under-designed piers. Besides, comparison of the near-field and far-field SGM excitations effect on the bridge response indicates that although in uniform excitations both sets cause approximately the same displacement response values, in the case of asynchronous inputs, the N-F records can produce larger ductility demands.

## کلمات کلیدی:

Asynchronous motions, Wave passage effect, Near-field, Forward directivity, Far-field, Apparent wave velocity, Long span bridge

## لینک ثابت مقاله در پایگاه سیویلیکا:

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