

Analytical Kinematic Expressions
For Pseudovelocity Shock Response Spectra
Of Generally Damped Linear Systems

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ABSTRACT:

Algebraic expressions were recently reported for the time-domain response of a base-excited mass-spring-damper (MSD) system to certain analytical inputs. These local, seismic inputs were idealized as stemming from remote shock inputs filtered through an arbitrary linear system's eigenstructure, under the assumption of proportional (Rayleigh) damping. Remote shock inputs of three forms were considered: (1) an ideal impulse, (2) a rectangular pulse, and (3) a saw-tooth pulse. The MSD kinematic responses were used to determine Shock Response Spectra (SRS) without necessitating numerical evaluation of a convolution integral. The present paper determines corresponding analytical expressions for the case of a generally damped (not necessarily Rayleigh-damped) linear system subject to a remote ideal impulse.

KEY WORDS: Shock, Shock Response Spectrum, Vibration, SRS

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